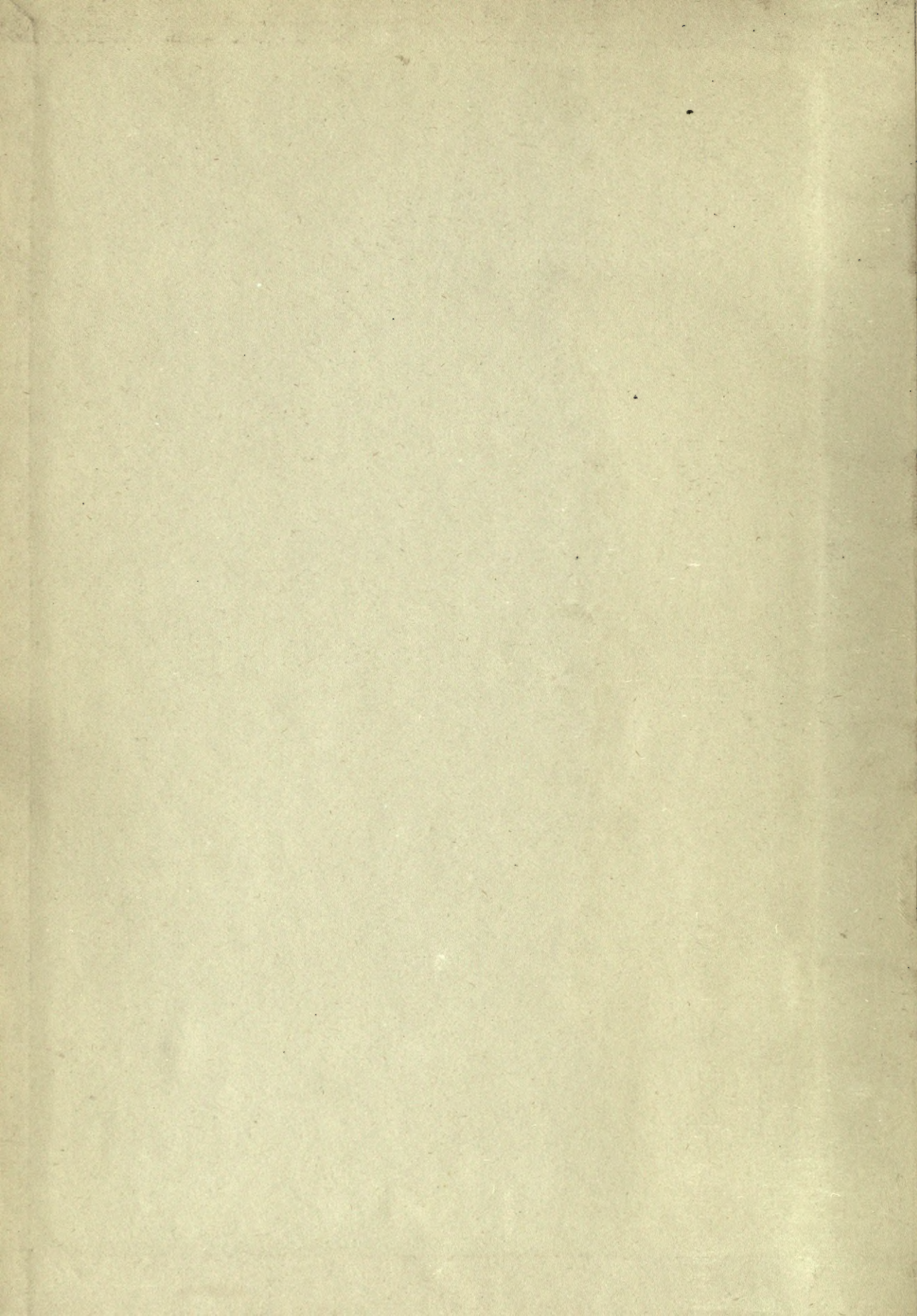


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SUPPLEMENTARY TO

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Volume XXXIII
July to December, 1921

169884.

16.3.22

PUBLISHED BY
THE SURGICAL PUBLISHING COMPANY OF CHICAGO
30 NORTH MICHIGAN AVENUE, CHICAGO

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INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1921

COLLECTIVE REVIEW

SPINA BIFIDA OCCULTA; WITH REPORT OF A CASE

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SPINA bifida occulta, which literally is the hidden form of cleft spine, may better be defined as a congenital abnormality in which there is a cleft or other defect in one or more of the spinous processes or laminae of the vertebrae but no external sac.

While the ordinary form of spina bifida was described by Nicolai Tulpius (91) of Amsterdam in 1685, the earliest record of the occult form, according to Brickner (13), was published in 1857 in the Transactions of the Pathological Society of London by Johnson Athol (2) who described a case with a "fatty tumor from the sacrum of a child, connected with the spinal membrane." The term "spina bifida occulta," however, was not used until 1875 when Virchow (98) reported the celebrated case of Miss Bell Carter of Blue Bank, Kentucky, who had been appearing in dime museums as the "lady with a horse's mane" and who proved to have a spina bifida occulta of the second to fifth dorsal vertebrae with an overlying hypertrichosis (46).

Since then clinicians and anatomists have considered this subject with increasing interest as the better understanding of the pathology illuminates some of the heretofore misunderstood maladies of the extremities and offers a rational hope for their therapy. The most fundamental conceptions of embryology have been investigated in efforts to arrive at the etiology. Another reason for the increased interest in the subject is that the condition is recognized to be much more frequent than previously suspected. While the incidence has been placed as high as 5 per

cent, perhaps the most accurate indication of the occurrence of spina bifida occulta may be obtained from the research of Theodora Wheeler (101). Wheeler studied 1,000 consecutive X-ray plates of the lumbar region in white adults and found an incomplete closure of the vertebral posterior arches in the last lumbar vertebrae to be present in 2.3 per cent. The entire sacral canal was open in 2.89 per cent of cases collected from five series.

Incomplete closure of the vertebral arches may be classified as follows (modified from Thorndike, 91):

I. Posterior spina bifida.

A. Rachischisis. The more severe form of spina bifida in which there is an incomplete closure of the neural canal for either all or part of its length. In these cases the everted lining of the neural canal forms a reddish band down the middle of the back.

B. "Spina bifida." The more common variety generally seen in infants: (a) hydro-meningocele, in which the sac fluid distends the subdural space; (b) myelomeningocele, in which the sac fluid is in the subarachnoid space; (c) syringomyelocele, in which the sac fluid is in the canal of the cord; and (d) the von Recklinghausen, or mixed type, in which the fluid distends both the central canal and the subarachnoid space.

C. Spina bifida occulta (merorachischisis).
II. Anterior spina bifida, which is rare.

While the etiology is as yet not accurately determined, numerous theories have been pro-

posed and a great deal of research has been done from the standpoint of both experimental embryology and pathologic anatomy. In the first few days of the life of the embryo there appears on its surface the dorsal groove which is soon deepened, infolded, and closed by the beginning of the third week. It is then pinched off from the overlying epidermis. At this stage in the development it will be seen that the closed neural tube or canal lies immediately subjacent to the skin, from which it presently becomes entirely free. In the normal course of events the mesoblastic tissue, from which the vertebral arches and the spinous processes are formed, interposes itself between the skin and the underlying neural canal. In spina bifida occulta, however, this fails to take place and the neural canal lies immediately below the skin and attached to it. The theories explaining the failure of this mesoblastic growth fall into two great classes. The first assume some disability in the mesoblastic tissue itself or in the adjacent and adherent epiblastic layers, while the second put the blame upon an excessive secretion of cerebrospinal fluid which prevents or retards the ingrowth of the mesoblastic tissues.

Virchow thought that the abnormality was due to local inflammatory processes which occurred in the third or fourth week. Marchand blamed mechanical causes. Mall's (50) theory of monsters ascribes them to faulty implantation of the ovum in the wall of the uterus and the subsequent disturbance of nutrition. More recently Joseph (48) has emphasized that the defect takes place in the membrano-cartilaginous stage rather than in the osseous stage. Experimentation has furnished some very suggestive information. Morgan and Tsuda (65) found that by placing frogs' eggs in a 0.6 per cent solution of sodium chloride, closure of the blastophore was prevented. Hertwig (40) elaborated this method to the extent that permanent spina bifida was produced. While Stockard (90) was able occasionally to produce spina bifida in *Fundulus heteroclitus* (the common minnow) by means of magnesium chloride solutions, as many as 50 per cent of his specimens showed cyclops. Of interest in this connection is Mall's (59) statement that spina bifida is usually accompanied by other malformations. That the mechanical action of amniotic adhesions might play a rôle is discredited by the work of Dareste (22) who artificially produced a spina bifida in amphibians which have no amnion. Tumors and foetal kyphosis have also been mentioned as possible causal agents in spina bifida.

Sharpe (85) contends with no little reason that spina bifida is caused by the pressure of an abnormally large amount of cerebrospinal fluid. He says that the choroid plexus of the cerebral ventricles are formed in the second month of foetal life or about one month before the skin and cord would normally be separated by the mesoblastic tissues. The increased pressure, particularly at the place of last closure, would tend to prevent or to retard the ingrowth of the mesoblastic tissues. He further strengthens his contention by the results of experiments on dogs. After a preliminary laminectomy, a large flap of skull was removed and pressure was applied to the exposed dural surface. The pressure having been gradually increased for some days, it was noted that there was a definite bulge in the lumbar region. The fact that hydrocephalus not infrequently follows spina bifida operations supports Sharpe's view. Patterson (68) showed that when the pressure in the canal is relieved the laminæ may take on a new growth.

Dependent upon the extent of the pathology, the symptoms attributable to spina bifida occulta may either be entirely absent or unnoticed throughout life or may be manifest from early infancy. The spinal cord may be normal or, according to Katzenstein (49), it may be abnormal by reason of a false anlage or pressure in early youth at the site of the deficiency or traction on the cord by the strand which connects the cord to the skin. Katzenstein (49), however, has called attention to the frequency with which the symptoms first appear at the age of puberty, that is, from the ninth to the seventeenth year. His explanation of this fact is that in these years skeletal growth is at its maximum and in consequence a maximum amount of pull is exerted on the lower end of the spinal cord which has remained adherent to the skin by a strand of epiblastic tissue which passes through the adjacent bony structures.

That there has been a pull on the cord since intra-uterine life is evident when we realize that at the age of 5 or 6 months the conus medullaris is normally at the level of the third lumbar vertebra. In some cases of spina bifida occulta the cord is stretched and narrowed so that its lower end is in the sacrum. Von Recklinghausen (73) reports a case in which the conus medullaris was opposite the second sacral vertebra. While this traction on the cord may cause symptoms in early life, it may be exerted so gradually that it has no effect until the increased discrepancy between the cord and the skeletal parts at puberty causes an extra amount of pull.

The pathology of spina bifida occulta is variable. Binder (10) says that the presence of a definite split in the vertebra is not an absolutely essential characteristic of spina bifida occulta. Brickner (13), who has studied the subject more, perhaps, than any one else in this country, concludes from his work at operation and autopsy that there may be a cleft of varying length or breadth in one or more of the arches accompanied by one of the following conditions:

1. A distinct meningocele protruding through the cleft.
2. Closure of the cleft by a tough membrane adherent to the overlying skin or non-encapsulated fat and connective tissue.
3. Perforation of the membrane by a dense band attached to the subcutaneous tissues externally and compressing the cord structures internally.
4. Lipomatous tissue within the canal concealed by this membrane.
5. Bulging of the dura mater.
6. An exostosis within the canal compromising the cord tissues.
7. A myofibrolipoma extending through the cleft and into the bony canal, disturbing and compressing the cord and its roots.
8. Degeneration of the cord tracts.

MacLulich (58) reports the case of a new-born child with a fistulous opening into the central canal of the cord. It is probable, however, that this case should not be classed as one of spina bifida occulta. Chiari (16) reports a case of spina bifida occulta sacralis with bony deformity of the pelvis.

There are numerous signs and symptoms which may occur in the clinical picture of spina bifida occulta but no one of them is invariably present. Many cases of spina bifida occulta have been reported in the literature, sometimes with one syndrome and sometimes with another. Woltman (104) has recently reviewed 187 cases of spina bifida including a number of cases of spina bifida occulta. He found the incidence of the various symptoms in this series to be as follows: involvement of the cord, 67 per cent; paralysis, 45 per cent; incontinence, 32 per cent; foot deformity, 23 per cent (bilateral, 21 per cent; club-foot, 17 per cent); anæsthesia, 20 per cent; hydrocephalus, 17 per cent; other dysplasias, 8 per cent. In three of the 187 cases he found sacral deformity; in 3, syndactylia; in 2, hypospadias; in 2, luxated hip; in 2, strabismus; in 2, hernia; in 2, cerebral defect; and in 1, cryptorchidism. In 7 cases (nearly 4 per cent) there was hypertrichosis (hypertrichiasis).

The appearance of hypertrichiasis over the area of the spine affected was so striking a phenomenon that some of the earlier observers believed that it was invariably present in spina bifida occulta. Bibergeil (9), however, found 15 cases in which it was absent. On the other hand, Ebstein (23) contends that spina bifida occulta is not always present in cases of hypertrichiasis.

The co-existence of vesical incontinence with spina bifida occulta has long been recognized. Peritz (69) states that 68 per cent of adults and 55 per cent of children with enuresis have a spina bifida occulta. In Smith's (88) case the bladder was in a permanent state of retention and overflow, and in Sheffield's (86) there was a protracted cystitis. These findings make one agree with Pfanner (70) who emphasizes the importance of investigating the spine in all cases of unexplained bladder disease. Despite the frequent concurrence of spina bifida occulta and enuresis, Lewandowsky (55) believes that they have nothing to do with each other although they are on the "same degenerative basis." That rectal control may be affected also is evidenced by the case of Girard (32) in which incomplete rectal incontinence was associated with complete vesical incontinence.

The foot deformities are variable. Corns and calluses, generally to the outer and under side of the foot, are frequent. Perforating ulcers are often found. Talipes equinovarus (87), talipes equinovagus (31), and even pes planus (15) and pes cavus have been reported. In Guthrie's case (36) there was paresis of the interossei of the foot, and in von Recklinghausen's case (74), a chronic osteitis of the metatarsal bones.

Pain has been inconstant. MacEwen (57) reports a case which he considered to be spina bifida occulta in which there was marked tenderness at the junction of the dorsal and lumbar regions although the spines of the twelfth dorsal and first lumbar were apparently normal. Ewald (27) says that spina bifida may cause pain in the back and in the legs. In the case he reports, however, in which there was a cleft in the fourth lumbar vertebra, there was loss of pain sense in the right arm. Saafeld (79) reports a case with neuralgia and disturbance of sensation in the extremities and neuralgia in the lower back.

A very constant physical sign is the presence of one or two sacral dimples, the foveola coccygea or foveola sacralis. Most frequently this is a single small pit just posterior to the anus. Cramer (20) says it is present in 40 per cent of infants and that if it has not disappeared by the tenth or twelfth year spina bifida is indicated.

As an example of nerve changes Guthrie's case (36) may be cited. In this, the sensitivity to heat and cold and pain was diminished over the whole course of the sciatic nerve and the posterior tibial nerve showed a slight reaction of degeneration. There may be motor or sensory paralyses or disturbances of the reflexes.

Congenital lipomata are not uncommon (44) (25). Scoliosis is of rather frequent occurrence. The muscles may be flabby and atrophied. The latter circumstance may cause an asymmetry of the calves and buttocks or even permit dislocation of the hip. The trophic ulcerations of the foot are commonly spoken of as *mal perforant* and may develop into an extensive gangrene. Elephantiasis of the skin, nævus or telangiectasis, and hammer toe have been noted in cases of spina bifida occulta. While Halstead (39) was stationed at Camp Hancock as a member of a disability board he found that a great many of the men who became fatigued readily and could not stand the pace of the military activities were proved upon examination to have spina bifida occulta.

The treatment is of two general types, the symptomatic or palliative, and the radical which involves operation on the spina bifida occulta. In the former the symptoms are treated as they arise according to the recognized medical and surgical procedures. The paralyses, incontinences, anæsthesias, paræsthesias, and hydrocephalus generally yield but little to treatment. The cases of cystitis are relieved by the ordinary treatment of that affection. Syndactylism, cryptorchidism, and hypospadias, while hardly to be regarded as due directly to the spina bifida occulta, may readily be treated by surgical means. It is not infrequently possible to relieve club-foot and trophic ulcers. Surgical drainage is indicated for the ostitis. Massage is useful not only in allaying pain but also in maintaining tone and nutrition in the atrophied muscles.

The symptomatic treatment of this malady has proved to be of very little use or else entirely futile. It is therefore not surprising that many workers have sought to attack the problem by means of an operation at the site of the spina bifida occulta. Probably the first case of this kind was that of Jones (47) who in 1891 operated upon a 22-year-old patient who had a bilateral paralytic club-foot with ulceration and also symptoms of paralysis. Jones reported that after the operation the symptoms of paralysis were relieved. Dalziel (21) reported a case with a very favorable result. The patient was 11 years of age and had suffered since infancy from incontinence of urine and fæces. There was a fatty tumor at

the base of the sacrum under which a deficiency in the roof of the sacral canal could be felt. There was complete anæsthesia over the buttocks, perineum, and posterior half of the external genitalia, i.e., the parts supplied by the third, fourth, and fifth sacral nerves. There was no hair over the tumor. At operation the fatty tumor was freed and the sacral nerves were found to be adherent to the inner surface of the theca. After the surplus theca was cut away, the nerves were returned to the sacral canal. Flaps of the sheath of the erector spinæ muscle were used to close the defect in the neural arches. As the result of this operation the patient had complete continence of both urine and fæces and perfect consciousness of when the bladder and rectum were full. The anæsthetic zone was diminished in size.

In 1903 Voelker (99) reported the case of a 23-year-old patient with elephantiasis of the right leg and syndactylism. At operation an exostosis which narrowed the spinal canal was found and was carefully chiseled off. A fibrous strand which ran through the bony orifice between the vertebræ and was attached to the dura was also cut away. At the end of seven weeks the severe pain which had been present in the left hip had practically disappeared, the anæsthetic zone was diminished in size, and the motor weakness was improved.

In Vallas' (94) case the ulcerations of the feet healed after the operation but the abnormalities of sensation showed little change. Reiner (75) reports a case of spina bifida occulta of the fifth to twelfth dorsal vertebræ in which the operation was not very successful. In Katzenstein's (49) case the cutting away of the strand which attached the dura to the epidermis resulted in great improvement. In Sharpe's (85) case there was no improvement after operation.

Elsberg (25) reported a very interesting case in 1911. A woman, 24 years of age, had painful ulcers on the calves and toes. Several of the toes had been amputated. She had a hairy lipoma of the lumbosacral region. The X-ray showed a hiatus between the fifth lumbar and the first sacral vertebræ. The sac of a spina bifida occulta had been removed and the adhesions between the several nerve roots and the dura were separated in 1908, two years previously. In 1910, however, the ulcers recurred. Elsberg did a laminectomy on the first, second, third, fourth, and fifth lumbar vertebræ, and found the cauda equina to be bound in a fibrolipoma. It was impossible to free the nerves from this growth. The left posterior root of the fifth lumbar nerve was divided. Following this operation the patient was relieved of pain. The ulcers healed but recurred later.

Brickner (13) collected 12 operative cases from the literature up to 1918 and added to this series 5 of his own. In these 17 cases there was no mortality. Brickner says that the operation for spina bifida occulta has not been brilliant and that this is probably due to the fact that the degenerative and neoplastic processes are scarcely remediable. He believes that cases in which there is a hernia of the spinal roots probably offer the best chance for a good result. At operation one may separate the adherent nerve roots from the membrana reuniens, divide the constricting band or strand, or remove exostoses and even teratomata. His indications for operation are: (1) in infants and children with spina bifida occulta without symptoms, in the hope of obviating symptoms, and (2) in adults with symptoms. Katzenstein (40) believes that the best chance for a good operative result is offered when the symptoms first appeared in early youth or puberty.

A case for presentation is as follows.

A male, 31 years of age, was admitted to Halstead's service at St. Luke's Hospital, Chicago, Feb. 28, 1921. In his work as a city fireman he had fallen from a ladder a distance of some 25 ft. and had injured his back. The patient was a man about 6 ft. tall and weighed about 180 lbs. Save for the usual diseases of childhood he had had no serious illnesses up to the present injury. On Feb. 1, 1921, four weeks before his admission to St. Luke's Hospital, he had suffered what was apparently a slight injury to his back but this confined him to bed for a few days and prevented him from working for about ten days. The injuries of Feb. 1 and 28 were in about the same place.

On admission to the hospital the patient was suffering from intense pain and tenderness in the sacral region and complete loss of vesical and rectal control. There was slight loss of pain sensation on the dorsal and lateral surfaces of both feet and a small area (about 2.5 cm. in diameter) of diminished tactile discrimination just to the right of the anus. The X-ray report was "... spina bifida occulta involving the top of the sacrum. The body of the first lumbar vertebra seems somewhat compressed—this is especially true of the right side."

The patient complained from time to time of severe pain in the knees. He was kept in bed, given sedatives, and kept warm with hot water bags. Catheterization was necessary until Mar. 13, 1921, two weeks after the injury, from which date the patient urinated voluntarily. The urine occasionally showed a faint trace of albumin, and on March 11 a hyaline cast was seen. The patient was discharged Mar. 21, 1921, able to walk with a cane but with some difficulty. He has returned to the hospital for electrical treatments to improve the tone of the thigh muscles.

This case is of interest in that it seems to show that spina bifida occulta is a potential weakness of the body structure and that an injury by violence to the sacrum or the lower lumbar vertebra may produce, temporarily at least, such symptoms as are found in some of the well-marked cases of spina bifida occulta with symptoms.

The writer wishes to express his thanks to Dr. Halstead for permission to report this case.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

ANÆSTHESIA

Miller, A. H.: *Blood-Pressure Guides During Anæsthesia and Operation.* *Pennsylvania M. J.*, 1921, xxiv, 372.

Between 15 and 45 per cent of the postoperative deaths in hospitals are ascribed to surgical shock. The fatalities occur not only among the serious cases but following the most trivial operations.

Accepting the blood pressure as a reliable index to the condition of shock, we would find, if the usual conception were correct, a distinct fall in blood pressure attending every severe surgical operation and the effect would be more pronounced if the patient did not have the protection supposed to be afforded by deep anæsthesia. On the contrary, routine blood-pressure observations show that if factors other than surgical traumatism are favorable, the most severe surgical manipulations may be performed regularly without marked change in either the blood pressure or the pulse rate.

Given a smooth, light anæsthesia, an operating room at a temperature between 70 and 80 degrees F., an organically sound patient, the dorsal position, protection from hæmorrhage and obstruction to the respiration, gastro-enterostomy, intestinal resection, cholecystectomy, complete protectomy, and major amputations are regularly accompanied by no marked changes in the blood pressure. While shock may be produced by surgical manipulations, in the present development of surgical technique the condition diagnosed as surgical shock usually results, not from surgical traumatism, but from other factors which if understood might be controlled.

In the presence of considerable hæmorrhage the blood pressure falls steadily and there is a corresponding increase in the pulse rate or both the blood pressure and the pulse rate remain stable for some time and then suddenly give way.

In respiratory obstruction, which is not always noticeable immediately, the blood pressure is a guide of great value. If the obstruction persists, there is a steady fall in the systolic and diastolic pressures. A frequent cause of obstruction of the air-way is the neck-band of the patient's shirt which becomes tightly drawn across the trachea when he is moved on the table. A falling blood pressure may often be traced to dyspnoea due to the weight of a surgical assistant resting on the patient's chest.

Exposure of extensive visceral or muscular surfaces in a cold room or the application of hot or cold solutions to such surfaces is followed by a fall in blood pressure.

A sudden change in the posture of the anæsthetized patient also results in a drop in the blood pressure, and protracted use of abnormal postures is accompanied by serious blood-pressure changes. Undoubtedly many patients with resistance already impaired have died as a result of the routine use of the Fowler postoperative position.

The most profound blood-pressure changes observed during operations result from anæsthetic over-dosage. The classical signs of anæsthesia depend upon the effects upon consciousness and the muscular system. Blood-pressure tests measuring the effect of the anæsthetic upon vital functions provide the most valuable indication of over-dosage of an anæsthetic.

In the pre-operative examination blood-pressure tests are of unsurpassed importance. During the operation they warn of the presence of injurious factors which should be avoided, and in unavoidable vital depression from shock or hæmorrhage they furnish a reliable index to the point to which the depression may be allowed to progress with a fair degree of safety.

Soldevilla, V., and Soldevilla, J. M.: *A Contribution to the Study of Spinal Anæsthesia* (Contribucion al estudio de la raquinovocainizacion). *Prog. de la clin.*, Madrid, 1920, viii, 24.

Unless a general anæsthetic is indicated definitely the author prefers spinal anæsthesia induced with novocaine for all infra-umbilical operations. Novocaine is better than cocaine and stovaine in that it does not cause meningeal irritation and its use is followed by slower fixation of nervous tissue. The stages of total abolition of sensibility are: analgesia and thermo-anæsthesia, paralysis, and loss of the sense of contact. Flaccid paralysis with total abolition of reflexes is obtained constantly with an injection of 0.15 gm. in the lumbar region or 0.10 gm. given by the dorsolumbar route. No immediate or late accidents or complications of importance have occurred. Nausea and vomiting which are so frequent following the use of cocaine and stovaine are reduced to a minimum. Retention of urine is not due as much to this particular method of anæsthesia as to the situation of the operation. Catheterization has been found necessary following herniotomy and perineal and vaginal operations performed under spinal anæsthesia but not oftener than following the use of a general anæsthetic. Post-anæsthetic fevers are rare and never serious. Severe post-anæsthetic headaches develop occasionally but are easily controlled with analgesics.

The instruments needed for spinal anæsthesia are a glass syringe, a cannula of platinum, and a puncture needle of gold-plated steel. Old solutions of novocaine should be discarded, especially when they show a yellow tint. After standing awhile novocaine is oxidized and becomes more irritating.

The puncture is made in the median line, this being easier, more certain, and less painful than a lateral puncture. Moreover, at this point there is less danger of puncturing small veins and the cord and its roots are not injured. The injection is given when possible with the patient in the sitting posture; otherwise, in the lateral recumbent position. The height of the puncture varies with the operation, the dose of anæsthetic, and the duration of anæsthesia desired. Dorsolumbar punctures are used for operations upon the inferior part of the abdomen and on herniæ, and lumbar puncture in the fourth interspace for operations on the perineum and lower extremities. Dorsolumbar injections produce a more rapid anæsthesia and the dose required is smaller. The solution is injected slowly, within three to five minutes, depending upon the size of the dose.

Among the advantages claimed for this method are that it may be used in cases of uncompensated valvular lesions and myocardial insufficiency. Operations upon the bladder are favored. No dietary preparations are necessary and there is not the danger of aspirating vomitus or pharyngeal exudates which is present in general anæsthesia. Muscular relaxation is more complete than when ether or chloroform is used and therefore the reduction of fractures and luxations is favored. Spinal anæsthesia induced with novocaine is also more rapid than ether

or chloroform anæsthesia and there is no need of an anæsthetist. Shock is almost entirely suppressed.

Among contra-indications are mentioned cases in which the spinal fluid is turbid, cases of tumor of the brain or meninges, recent syphilis, and suppurative lesions of the skin of the back, the cases of very excitable persons, and the cases of children.

W. R. MEEKER.

Ranucci, F.: The Effect of Spinal Anæsthesia on the Function of the Liver and Kidneys (Azione della rachianestesia sulle funzioni del fegato e del rene). *Policlin.*, Roma, 1921, xxviii, sez. prat., 323.

Ranucci's study is based on 67 cases. The anæsthesia was induced with a mixture of stovaine and novocaine (4 parts of stovaine to 2 parts of novocaine). The patients' ages varied from 16 to 75 years. The postoperative course was normal in every instance. Urination occurred spontaneously. In every case there was a decrease in the amount of urine, and in 1 case anuria for twelve hours. In 2 cases there was transient diplopia, and in 20 cases in which the amount of nitrogen in the blood was determined before and after operation a slight increase was noted after operation. No glucose, acetone, biliary pigment, or urobilin was found. In 21 cases the urine contained some albumin, and in 5 cases, granular and hyaline casts.

These findings agree with those of other investigators as they show that the lesions produced in the liver and kidneys by spinal anæsthesia are slight and transitory. It may therefore be said that in the cases of patients with renal and hepatic disturbances spinal anæsthesia can be used with much less risk than general anæsthesia. W. A. BRENNAN.

SURGERY OF THE HEAD AND NECK

HEAD

Houssay, B. A.: The Physiology and Pathology of Intracranial Hypertension (Fisiologia y patogenia de la hipertension craneana). *Rev. Asoc. méd. argent.*, 1920, xxxiii, 477.

Intracranial pressure depends upon anatomical factors such as the cranial covering and cranial contents, and upon physiological factors such as the blood circulation and the circulation of cerebrospinal fluid.

The cranium and dura mater form an almost rigid covering. In infancy the thin elastic bones may separate in chronic hypertension as they are united only by a membrane. In adults there is no distension, but hypertension of long standing makes the bones thinner and may produce a change in the contour of the calvarium. Local processes such as internal pressure due to cysts and tumors may erode the overlying bone or disengage sutures at neighboring points as in a rhinorrhœa of cerebrospinal fluid. Intracranial pressure is distributed uniformly over the entire brain, a fact which explains the early appearance of choked disc in many cases.

The volume of cranial contents depends principally upon the blood circulation, the circulation of the cerebrospinal fluid, the amount of brain substance, and the influence of respiration. The soft brain mass receives the systolic waves of the arterial pulse which increase the intracranial pressure so that even the veins are compressed and empty during the pulsations. The intracephalic arterial pulse may be appreciated by the plethysmograph in trephining operations on the skull.

Respiratory variations are characterized by an inspiratory diminution and an expiratory increase in pressure. These differences have been studied in persons with cranial defects. They are due to the influence of respiration on the circulation, especially the venous return. Vasomotor nerves have not been demonstrated in the cerebral vessels, but some investigators interpret the contraction of these vessels produced by adrenalin in high concentration as proof of the presence of vasoconstrictors.

In certain cases presenting clinical symptoms of marked hypertension no increased amount of fluid, tumor, or visible circulatory disturbance is found

when the cranium is opened. This fact leads to the belief that there may be circulatory disturbances of the interstitial tissue or a hydration or tumefaction of the parenchyma due to some physicochemical alteration, but to date this subject has not been investigated experimentally.

Clinically evident hypertension depends above all upon the amount of circulatory disturbance and spinal fluid circulation. The cerebrospinal fluid is formed by the choroid plexus of the ventricles and reaches the exterior through the foramina of Luschka and Magendie, thus bathing the nervous tissue. It is then absorbed principally by the lymphatics of the subdural space of the brain and cord.

An obstructive type of hydrocephalus may be caused experimentally by the introduction of foreign bodies into the aqueduct of Sylvius and by the injection of animal charcoal into the third ventricle. Such obstruction produces internal hydrocephalus and demonstrates the increase of cerebrospinal fluid in the lateral ventricles with subsequent passage to the third and fourth ventricles and then to the exterior. Inflammatory processes which occlude these passages or compress them, such as subtentorial tumors, cause internal hydrocephalus. Unilateral internal hydrocephalus may be produced experimentally by occluding the foramen of Monroe but if the choroid plexus is extirpated dilatation of that ventricle does not result.

Experimental hydrocephalus has resulted also from a decrease in absorptive power produced by adhesions resulting from the action of irritant chemicals which obliterate the subarachnoid space, the principal site of absorption. W. R. MEEKER.

Finochietto, E.: Indications and Surgical Treatment in Cranial Hypertension (Indicaciones y tratamiento quirúrgico de la hipertensión craneana). *Rev. Asoc. méd. argent.*, 1920, xxxiii, 528.

Among the factors which may cause intracranial hypertension are trauma, circulatory toxins, inflammatory processes, spontaneous hæmorrhage, foreign bodies, and tumors. Hypertension may be local or general and acute or chronic. The first important symptom is cephalalgia. This is usually intense and due to tension upon the dura mater which is innervated by the fifth nerve. A small tumor of the dura may cause intense headache out of all proportion to the other symptoms and greater than that caused by a much larger tumor located in the center of the cerebrum. Vomiting is due to stimulation of the medullary center and is not usually accompanied by nausea. Choked disc is a constant sign and continues until the end. It appears early because of the great sensibility of the retinal veins to changes in pressure, its origin being entirely mechanical. Its appearance does not always coincide with the development of the other symptoms. A tumor which compresses the optic chiasm may cause blindness from optic atrophy before other symptoms

of compression appear. Therefore choked disc is indicative only of increased intracranial tension and is little influenced by the location, size, or nature of the lesion.

Unconsciousness due to compression may be sudden or gradual. If the compression comes on gradually the brain more or less accommodates itself, and unconsciousness, if it comes on at all, is considerably deferred.

In the treatment of this condition many methods are used, all having as their end the reduction of pressure. Lumbar puncture, ventricular puncture, puncture of the corpus callosum, ventricular drainage, and decompressive trephining operations are all employed.

Lumbar puncture is of greater diagnostic than therapeutic value. In traumatic serous meningitis whose only symptom is hypertension repeated lumbar punctures are often curative. They have been employed also in congenital and chronic internal hydrocephalus. Lumbar puncture has a therapeutic value also in cerebral tumors but in some cases has given rise to fatal accidents.

Ventricular puncture is a more important operation but its indications are more limited. It has been employed in chronic hydrocephalus of children. It is valuable also in craniectomy for cerebral tumor when the exact location of the growth is not known. If upon puncture a ventricle is found to be dilated, it is improbable that a tumor is present in that hemisphere. Evacuation of the contents of a ventricle diminishes the tension so that digital palpation of the cortex is favored.

Puncture of the corpus callosum consists in trephining a little behind the coronal suture sufficiently lateral to the median line to avoid wounding the longitudinal sinus. The dura is opened in an avascular area and a flexible cannula is passed to the corpus callosum. The lateral ventricle is then entered by perforation of the corpus callosum. The method is very easily executed and makes an ample connection between the ventricles and subdural space.

Craniectomy is the most important of all the methods of combatting intracranial hypertension. Subtemporal decompression by Cushing's method is employed, especially in cases of inoperable brain tumor. The bulging relieves pressure, and while a moderate cerebral hernia may result there is no fungus cerebri. The operation has been performed with good results also in certain cases of renal disease when medical treatment and lumbar puncture have failed to relieve uræmic symptoms or when blindness was impending. Its effect in cases of brain tumor is sometimes extraordinarily beneficial. It does little good when a tumor has caused coma. Its most important use is for the abolition of choked disc; therefore early operation before atrophy begins is essential. This operation is employed by the author in cases of extradural hæmorrhage, fractures of the base, intra- or subdural traumatic hæmorrhages, serous encysted meningitis, cerebral

or cerebellar abscess, simple cysts, gumma, tuberculoma, and endothelioma of the dura in addition to the many varieties of brain tumors.

W. R. MEEKER.

Dandy, W. E.: The Cause of So-Called Idiopathic Hydrocephalus. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 67.

The cerebrospinal fluid circulates in a closed vascular system. This is just as well-defined as the vascular systems for blood, lymph, bile, or urine.

The ventricular system in which the fluid is produced but not absorbed is lined with high cubical and columnar epithelium, while the subarachnoid space, in which the cerebrospinal fluid is absorbed, is lined with low mesothelial cells. Nearly all the cerebrospinal fluid is absorbed in the cerebral sulci.

Collateral circulation is almost precluded in the ventricles and the cisternæ. An obstruction in these spaces, therefore, results in hydrocephalus just as closure of a ureter results in hydronephrosis. If the obstruction is situated in any part of the ventricles—usually the aqueduct of Sylvius or the foramina of Luschka and Magendie—the hydrocephalus is of the obstructive type, while if it is situated in the cisternæ or the main branches of the cisternæ, the hydrocephalus is of the communicating type.

That the cause of communicating hydrocephalus (the remnant of so-called idiopathic hydrocephalus) is an obstruction in the cisternæ is conclusively demonstrated by three facts:

1. Communicating hydrocephalus can be produced by blocking the mesencephalic cisterna.
2. The obstruction can be graphically demonstrated in the experimental animal or at necropsy on man by injecting a suspension of India ink into the spinal canal; the color stops abruptly at the obstruction.
3. During life the obstruction can be clearly shown by cerebral pneumography after air has been injected into the spinal canal; the air also stops at the obstruction and is sharply outlined in the roentgenogram.

The obstruction in the subarachnoid space is most frequently located in the mesencephalic or pontine cisterna. However, the obstruction need not be in the cisternæ necessarily; it may be in the large branches which carry the fluid from the cisternæ chiasmaticæ and interpedunculares to the cerebral sulci. Any number of these branches may be occluded. If all the main branches are obstructed the hydrocephalus will be the same as if the occlusion were in the cisterna. If some of the branches remain unobstructed, the degree of hydrocephalus will be modified proportionately; even a complete cure may result because of the absorption which takes place in the remaining patent areas of the subarachnoid space.

Adhesions following meningitis and occluding the cisternæ are the cause of most cases of communicat-

ing hydrocephalus. By blocking the foramina of Luschka and Magendie they are responsible also for many cases of obstructive hydrocephalus. Adhesions give infallible proof of a pre-existing meningitis. The post-meningitic occlusions have no relation to the severity of the attack and the number of adhesions, but are dependent upon the location of the adhesions.

In two cases the hydrocephalus appeared to be due to a congenital failure of the cisternæ or their branches to develop. Tumors in the pons, medulla, or midbrain also produce partial or complete obstruction of the subarachnoid space and therefore cause communicating hydrocephalus.

Pneumographic records are shown demonstrating the existence of a very early stage of communicating hydrocephalus and the reason for its unusually tardy development and its spontaneous arrest.

SAMUEL KAHN.

Burch, L. E.: Head Injuries. *South. M. J.*, 1921, xiv, 211.

All patients with head injuries should remain in the hospital for four days for observation.

The author emphasizes the importance of the pulse as a valuable sign. A fast pulse signifies shock. A descending pulse is favorable until it reaches 60; when increased it suggests intracranial pressure. If a slow pulse is followed by a fast one the prognosis is unfavorable as medullary oedema is indicated.

The X-ray is very valuable in the diagnosis of fractures, but it must not be forgotten that negative X-ray evidence does not eliminate the possibility of serious intracranial injury.

In certain cases surgical intervention will be a life-saving measure but neither operation nor manipulation should be attempted during a period of shock, when the pulse is above 120, when the temperature is 105 degrees, or during the period of medullary oedema.

The mercury spinal manometer offers the best indication of the degree of intracranial pressure. Above 16 mm. (normal being 5 to 9 mm. Hg.) indicates the danger zone and is a signal for immediate relief.

L. D. SNORF.

Wilson, G.: The Diagnostic Significance of Jacksonian Epilepsy. *J. Am. M. Ass.*, 1921, lxxvi, 842.

Jacksonian spasm is by no means diagnostic of a lesion of the motor cortex. Probably the most common cause of this form of spasm is idiopathic epilepsy itself, and many errors in diagnosis might be prevented by a careful examination of the patient and close scrutiny of the facts and history. A person with Jacksonian epilepsy should not be operated upon unless other signs and symptoms of intracranial disease are present.

Other conditions to be considered in the case of a patient exhibiting Jacksonian epilepsy include: (1) lesions other than tumors of the motor cortex; (2) tumors in parts of the brain remote from the

motor cortex which sometimes produce monospasm; (3) toxic conditions; (4) the myoclonic type of epidemic encephalitis; (5) the so-called "reflex epilepsy"; (6) hysteria, which may simulate Jacksonian epilepsy; and (7) idiopathic epilepsy which frequently has an "inside" Jacksonian spasm.

The author cites several cases illustrating these different conditions which have strongly simulated a tumor or lesion of the motor cortex. In some of these cases in which an operation or autopsy was performed no lesions of the central nervous system were disclosed.

MARCUS HOBART.

Breslauer-Schueck, S. F.: The Functional Effect upon the Brain of Direct Injections (Funktionelle Beeinflussung des Gehirns mittels direkt eingespritzter Substanzen). *Deutsche med. Wchnschr.*, 1920, xlii, 1295.

Brain substance can be influenced functionally by the direct injection of drugs. It may be stimulated, depressed, or paralyzed. The technique of the injection is that of the usual brain puncture. By the injection of the common anæsthetics the paths of conduction of the brain may be blocked in the same way as the peripheral nerves. Any desired area may be excluded functionally by the injection of a small amount of solution.

In two cases of epilepsy the attacks were stopped almost immediately by the injection of a few centimeters of a 1 per cent novocaine solution into the primarily irritated areas. Other therapeutic possibilities are suggested by the fact that any area of the brain may be excluded without injury to surrounding areas. The diagnostic possibilities of the method are also apparent. The author has never observed any areas of softening following the injection of cocaine or novocaine.

The first experiments made on man in the stimulation of the brain by means of injections were carried out by Breslauer-Schueck with caffeine. In brief it may be stated that the center stimulated showed an extraordinary exaggeration of function. In old gunshot wounds of the head the injection into severely damaged and partially paralyzed motor centers produced a marked increase in the voluntarily induced movements in the respective limb.

Of great therapeutic importance is the action of caffeine upon the respiratory center. In the cases of dying patients the author has several times injected caffeine into the region of the medulla oblongata through a small trephine opening. Following such an injection in a case of cerebral embolism severe Cheyne-Stokes breathing became normal and regular within a few seconds and remained regular for sixteen hours longer. It may be stated positively that the stimulation of the oblongata with caffeine is the most effective resuscitation method we have. The indication for its use depends, of course, upon whether prolonged stimulation lasting for hours or days will permit recovery from the causal disease.

To work out the method on the human subject the utmost care must be exercised to prevent the formation of areas of softening and hæmorrhage. Softening may be prevented by the use of chemically neutral solutions, and hæmorrhage, by the use of very fine needles and care not to perforate the large vessels at the base of the brain or the sinuses. Great care is necessary in the injection of the medulla oblongata as the anæsthetization is followed by respiratory weakness for half an hour.

BIBERGEIL (Z).

Friedman, G. A.: Suggestions Regarding the Rôle of the Hypophysis in Graves' Disease and Myxœdema. *N. York M. J.*, 1921, cxiii, 370.

All ductless gland disturbances may manifest themselves clinically without gross or microscopic changes. The primary affection may arise in the nerve leading to the gland.

The anterior lobe of the hypophysis is abundantly supplied with sympathetic fibers while the posterior lobe is devoid of such fibers. On account of the rich sympathetic nerve supply of the anterior lobe an interrelation between this lobe and Graves' disease and myxœdema becomes *a priori* highly probable. In acromegaly enlargement of the hypophysis is not essential for the appearance of clinical symptoms pointing to overactivity of the gland. However, there may be histologic changes pointing to hyperfunction.

In animals there is a state of somnolence after partial or complete removal of the anterior lobe which is similar to the condition met with in hibernating animals. The most notable changes occur in the pars anterior of the hypophysis. There is a marked decrease of eosinophiles and basophiles. When the animals waken from their sleep the characteristic cellular elements reappear. Since hibernation is a hypopituitary condition, it must be assumed that in man similar changes occur in the anterior lobe of the hypophysis in hypopituitarism. Similar changes in the pituitary occur after feeding with thyroid.

Removal of the parathyroids alone does not appear to be productive of such marked changes in the hypophysis as removal of the thyroid.

From all these considerations it seems possible that the hypophysis, especially the anterior lobe, has a share in the histopathology of exophthalmic goiter and myxœdema. Hypophyseal overactivity without anatomical hypertrophy appears to be characteristic of the former condition, and hypophyseal hypertrophy and hypo-activity of the latter. The fact that the anterior lobe possesses a sympathetic nerve supply suggests that some of the symptoms and signs of Graves' disease and myxœdema are due partly to the co-operation of the hypophysis.

Acromegaly is often a combination of hyperpituitarism and hypopituitarism. Thus an increased metabolic rate in acromegaly may be expected only when it is a pure hyperpituitarism or in its initial

stage. In hypopituitary states, which are nearly as typical as hypothyroid states, one should expect to find more often a decreased metabolic rate.

In Graves' disease the hypophysis seems to show histologic changes similar to those in hyperpituitarism, and in myxœdema changes similar to those in hypopituitarism. Therefore there is a certain degree of hypophyseal hyperactivity in hyperthyroid states and of hypo-activity of the pituitary in hypothyroid states. Chromophilia of the anterior lobe is characteristic of Graves' disease, while chromophobia is characteristic of myxœdema. The following symptoms and signs of Graves' disease may be in part attributed to hypophyseal overactivity: the increased metabolic rate, especially emaciation; the tendency to glycosuria; mental irritability, especially insomnia; intestinal spasticity; a tendency to miscarriages; acceleration of skeletal growth, especially acceleration of epiphyseal closure.

The symptoms and signs of myxœdema attributed to hypophyseal underactivity are: a decreased metabolic rate (adiposity); a higher sugar tolerance and absence of glycosuria; mental depression (somnia); intestinal atony; rarity of miscarriage; and retardation of skeletal growth, especially retardation of epiphyseal closure.

It is very probable that there may be a mild overactivity of the hypophysis in Graves' disease and a mild underactivity in myxœdema. Pituitary products therefore should be regarded as contraindicated in the treatment of exophthalmic goiter and indicated in addition to thyroid in myxœdema.

M. H. KAHN.

McEvoy, F. E.: A Simple Incision for Operations on the Gasserian Ganglion. *Surg., Gynec. & Obst.*, 1921, xxxii, 271.

The author states that the first successful intracranial operation for the relief of trifacial neuralgia was performed in 1890. Since that time specially adapted instruments have greatly simplified the technique. Various types of incisions have been employed: horseshoe-flap incisions, musculo-cutaneous horseshoe-flap incisions, and question-mark incisions, each one being simpler and less time-consuming than its predecessor.

The incision advocated by the author and used in the Mayo Clinic for the last few months begins at the lower border of the zygoma and extends 8 cm. backward and upward in the direction of the fibers of the temporal muscle. It is extended through the skin, fascia, and muscle, but in addition, the temporal fascia is divided parallel with the zygoma for a distance of 0.5 cm. in each direction from the oblique incision, greater exposure of the lower angle being thus afforded. A self-retaining retractor is used to expose the bone for decompression with removal of bone down to the floor of the middle fossa.

This type of incision has distinct advantages: (1) it is simple and can be rapidly made and closed, (2) it precludes the possibility of injury to the

temporal branch of the facial nerve, (3) it is entirely within the hairline and leaves no visible scar, and (4) it prevents the swelling so apt to occur around the orbit in flap incisions.

W. O. ORT.

Poenitz, K.: A Case of Successful Operation for a Tubercle of the Nucleus of the Facial Nerve (Ueber einen mit Erfolg operierten Solitaertuberkel des Facialiszentrums). *Deutsche Ztschr. f. Nervenh.* 1920, lxxvii, 89.

During the course of the war a 38-year-old sergeant became partially deaf in the left ear. He had also intervals of unconsciousness which began with spasm of the face on the left side. As nothing else was found, the condition was considered to be hysteria and he was treated by suggestion.

In the clinic he showed clonic twitching of the left half of the face with the exception of the muscles of the brow. He was not unconscious, but the pupils dilated and did not react to light. Occasionally contractions occurred in the left arm.

Trephination showed a hard area the size of a cherry in the nucleus of the facial nerve which proved to be a solitary tubercle. After it was removed the spasms stopped and there was almost complete recovery except for slight dizziness.

WEICHERT (Z).

Roy, J. N.: War Surgery: Plastic Operations of the Face by Means of Fat Grafts. *Laryngoscope*, 1921, xxxi, 65.

Many methods have been tried for the æsthetic repair of facial wounds. When a traumatism has resulted in a loss of substance of the malar bone, the orbital ridge, or the anterior wall of the frontal sinus, it is necessary first to treat these different parts according to the needs of the moment. After the wound has healed and time has finished its sterilization, restoration may be considered. If the loss of substance affects only the subcutaneous cellular tissue and there is a more or less decided depression, fat grafts must be used to fill up the cavity. After the whole cicatrix has been thoroughly removed and the skin liberated to slightly beyond the edges of the depression, hæmostasis must be made complete. An incision is then made on the thigh or buttock and a small portion of adipose tissue is taken and immediately placed in the wound to be restored. The lips of the wound are then closed with the greatest care.

The author reports four cases in which such fat grafts were used. The first patient, 20 years of age, had a bullet wound in the left submalar region. The bullet was removed two days after the injury and a contention apparatus was applied to the fracture of the lower jaw. This case came under the author's care about three weeks later. The wound, which suppurred profusely, opened into the mouth. The surrounding tissues were detached and very much infiltrated, and considerable trismus was produced by a lesion of the masseter and the perpendicular portion of the lower maxilla on

the right side. The opening caused by the entry of the projectile was closed, but its passage across the velum palatum was still visible. The maxillary sinuses were not injured. By appropriate dressings the cavity was sterilized. Exercises of progressive dilatation of the mouth to overcome the trismus were begun and a prosthetic apparatus to replace the broken teeth was inserted. Two months later the wound in the cheek was represented by an oblique and fairly deep cicatrix about 4 cm. long. Under chloroform anæsthesia the cicatrix was ablated and a fat graft inserted according to the method outlined. The result was entirely satisfactory.

The second patient, 24 years of age, had a penetrating wound in the left malar region with considerable constriction of the inferior maxilla caused by a shell fragment. The shell fragment was removed and the wound healed. The cicatrix which remained after healing was treated successfully in the same manner as in the first case.

The third patient had been wounded in the right orbit by a shell fragment. When the author first saw the wound it was suppurating profusely. A sequestrum of the orbital wall was removed. The wound was sterilized by ablation of the granulation tissue, the application of aseptic dressings, and heliotherapy. Suppuration diminished rapidly. Some time later, under chloroform anæsthesia, the cul-de-sac was rebuilt after dissection and two Thiersch grafts taken from the thigh were applied and held in the orbital cavity by a lead mould. A cicatrix in the temporal region also was ablated. Because of the loss of bony substance, a lamella of the cartilage of the calf, perfectly sterilized, was inserted into the cellular tissue of the external wall of the orbital cavity. A fat graft of sufficient size to fill the rest of the cavity was then inserted. An artificial eye was later put in and the patient was well pleased with the result.

The fourth patient, a woman of 25 years, had a cicatrix and a large cavity of the left cheek near the labial commissure, the result of noma. On the inside of the mouth was a large cicatricial contraction which tied the lip to the gum. Four teeth had been lost. The first operation on this patient was performed to mobilize the lip. Later the cicatrix was dissected out and a fat graft inserted. The result was satisfactory. MARGARET I. MALONEY.

Lanz, O.: Furuncle of the Lip (Lippenfurunkel). *Nederl. tijdschr. v. geneesk.*, 1920, lxiiv, 2475.

Lanz reviews experiences in the treatment of furuncle of the lip during his assistantship at Kocher's clinic. One of the assistants developed such a furuncle and during the absence of Kocher it was incised by one of the other men. Four days later the patient died of pyæmia. A day later a second assistant who had attended the patient developed a sore throat; three days later he also died of pyæmia. The staphylococcus pyogenes aureus gained entrance into the body of the second patient through the tonsils.

At the time this report was written a youth with a furuncle of the lip was brought to Lanz' clinic. The patient was already suffering with pyæmia and the incision wound had been tamponed. Tamponade, according to Lanz, is unsurgical in such cases; open treatment alone should be considered but the danger of incision must be borne in mind. As the face is rich in blood and lymph vessels the entrance of pus-producing organisms into the circulation is favored. Furuncle of the lip is to be considered a serious condition from the very first moment.

The patient should be put to bed and contact infection by the hands prevented. Further conservative treatment should be instituted with warm salicylic compresses. If incision is absolutely necessary, the necrotic center of the furuncle should be treated with the thermocautery without pressure. The opened blood and lymph vessels should also be seared. In this manner the author has treated successfully 7 cases of pustula maligna. The surgeon should always be very careful in handling the pus and should wear rubber gloves. КОСН (Z).

NECK

Mayo, C. H.: The Thyroid and Its Diseases. *Surg., Gynec. & Obst.*, 1921, xxxii, 209.

The author discusses the work of Kendall in relation to the discovery of thyroxin and the studies of Plummer concerning the effect of thyroxin on metabolism. Hyperfunction of the thyroid gland raises the basal metabolic rate, while hypofunction lowers the rate. Metabolism can be returned to normal in most cases of hypothyroidism by the administration of thyroxin.

The thyroid gland enables the body to develop an available iodinated secretion from the iodides in food. In simple colloid goiter there is an increased amount of iodine in the gland, while in exophthalmic goiter there is a deficiency of iodine. Wilson has shown that the amounts of hypertrophy and hyperplasia in exophthalmic goiter usually vary in proportion to the degree of toxicity. The thyroid consists of encapsulated alveoli held together by a stroma of connective tissue. The vesicles are lined by a single layer of cells. In exophthalmic goiter there is a crowding of the epithelium and vesicles with no retention of secretion. In simple goiter there is an excess of secretion. In two-thirds of one hundred cases of myxoedema thyroiditis was the cause of destruction of the gland. Simple goiter may occasionally cause a low metabolic rate. The cause of goiter may lie in the chemistry of infection, a toxæmia which is produced within the gland or at a focus.

Thyroxin benefits patients with cretinism and cures those with myxoedema. The treatment of simple goiter is the administration of iodine or thyroxin, preferably the latter. Operation is the treatment of choice for adenoma of the thyroid.

Patients with exophthalmic goiter have exacerbations and remissions of symptoms. The earlier

operation is performed in the course of the disease the safer it will be. It should not be performed in an exacerbation of symptoms.

Hyperthyroidism due to adenoma should be differentiated from exophthalmic goiter. It occurs in goiter of long standing, fourteen to twenty years, and there is no exophthalmos. The patient has a tachycardia and develops arrhythmia. The average age at which the condition appears is 43 and the average age at operation is 48. In exophthalmic goiter the average age is 36, and the exophthalmos occurs in 50 per cent in the first few months and in 87 per cent within two years. There is tachycardia, but the pulse is steady until degenerative changes ensue. The diagnosis of exophthalmic goiter is greatly aided by the metabolism test. Exophthalmic goiter occurs five times more often than adenoma with hyperthyroidism. The types of goiter should always be distinguished.

In patients who have respiratory difficulty the isthmus of the thyroid should be divided first. The posterior capsule of the gland should be preserved in order to avoid nerve injury and protect the parathyroids.

In the Mayo Clinic during 1919, 1,709 of 2,205 operations on the thyroid gland were performed under ether anaesthesia, and 135 with novocaine. In 363 cases combined anaesthesia was used. In recent years only about 20 per cent of patients come to operation in the late stages of the disease. In the last series of cases there were 144 consecutive operations for exophthalmic goiter without a death. According to the condition, the mortality will range from 0 to 3 per cent. J. A. H. MAGOUN, JR.

Judd, E. S.: The Laryngeal Function in Thyroid Cases. *Ann. Surg.*, 1921, lxxiii, 321.

Before considering the relationship of goiter and thyroidectomy to disturbances of laryngeal function it is necessary to bear in mind the fact that a small percentage of otherwise normal persons have some degree of paralysis of one or both cords of which they are unaware.

Paralysis of the recurrent laryngeal nerve caused by a goiter occurs apparently in somewhat more than 5 per cent of all patients with goiter. The disturbance is not directly attributable to the size of the gland and is not always referable to the side of greatest enlargement. Carcinoma and hysteria must be considered when total loss of voice occurs in association with goiter. It is therefore evident that a laryngoscopic examination is desirable before operation.

Following thyroidectomy two types of disturbance of laryngeal function are found. One, a temporary loss of voice following almost immediately, is transitory, function being restored in a few days or a few weeks. The other, a delayed bilateral abductor paralysis producing dyspnoea, is very persistent. The causes of the former type are known to include mechanical replacement of the larynx which has been pushed aside by the goiter,

oedema, myositis, and trauma to the recurrent nerve. The cause of the latter type is not known.

It has been found experimentally that to produce lasting paralysis the trauma must consist of division or ligation of the nerve. Pinching it produces only temporary paralysis, and stretching for a short time may cause none whatever. If the nerve is permanently stretched, paralysis may or may not occur.

In the twelve cases of bilateral abductor paralysis studied by the author the causative factor was obscure. It may be scar contraction, trauma, or toxæmia. Nine of these cases appeared among about 25,000 thyroidectomies at the Mayo Clinic and three of the patients so affected had been operated on elsewhere. Phonation was not an index to these cases. The onset of dyspnoea (due to paralysis of the posticus muscles), was delayed for from four to eight weeks and was gradual. The voice remained normal at this time except for the effect of the dyspnoea. The increasing difficulty in breathing made tracheotomy appear advisable in four cases wherein it was done, although the necessity for it is not established. In one case tracheotomy was performed seventeen months after the goiter operation.

The smaller number and greater vulnerability of the terminal fibers going to the abductor muscles as compared with those going to the adductors may have some bearing on this delayed paralysis.

J. W. ROSS.

Fitz, R.: The Relation of Hyperthyroidism to Diabetes Mellitus. *Arch. Int. Med.*, 1921, xxvii, 305.

The literature on the subject, which the author reviews, indicates that the possibility of a relationship between hyperthyroidism and diabetes has been recognized for a long time. The earliest report dealing with this relationship was that of Dumont-pallier which appeared in 1867. In 1906 Friedrich Mueller suggested that a special type of glycosuria is related to exophthalmic goiter.

Thirty-nine hitherto unreported cases are reviewed. Thirty-three of these case reports were obtained from the Mayo Clinic and 6 from the records of the Massachusetts General Hospital. Five patients with non-toxic goiter were operated on with no mortality; 6 with exophthalmic goiter, with one death; and 6 with toxic adenoma, with one death. Operation is not contra-indicated in properly selected cases. Hyperthyroidism and diabetes occur together in a small number of cases but there is no established evidence that such coincidence is due to more than chance.

Thyroidectomy alone has no curative effect on the diabetes. This is shown by the patients with non-toxic goiter whose diabetes did not improve after operation. In the cases of certain patients with toxic thyroid disease and diabetes who improved after partial thyroidectomy the improvement was due probably to the lowering of the basal metabolic rate.

G. S. FOULDS.

Deaver, J. B.: *The Surgical Aspect of Hyperthyroidism.* *N. York M. J.*, 1921, cxiii, 265.

The author believes that successful results in the surgical treatment of primary hyperthyroidism depend to a great extent upon the time at which operation is performed. In mild and moderately severe cases operation may be performed at a convenient time between the attacks. In the severe type the disease often causes visceral complications which, when added to the dominant symptoms, make the time to operate a matter of judicious selection. The cardiac symptoms Deaver believes are of greater importance with regard to the choice and time of operation than the renal symptoms. Another vital point for success is the patient's mental attitude as both the pre-operative regime and the postoperative treatment are of as much importance as the operation itself.

Cases of hyperthyroidism should be treated in a special hospital or a special department of a general hospital. It is in this type of case that Crile's anoci-association finds its most ideal application. The anæsthetic to be preferred is nitrous oxide and oxygen unless this is especially contra-indicated. Deaver is not an advocate of local anæsthesia. While open to conviction on the matter, he does not believe he can be convinced of its value.

Preliminary upper pole ligation occasionally proves of such benefit that further surgery is obviated. Ligation of the upper poles is to be preferred. Among the serious postoperative phenomena is acute hyperthyroidism with hyperpyrexia and consequent increased metabolism. When in less severe cases the patient is restless and difficult to manage, opium should be given.

E. C. ROBITSHEK.

Crile, G. W.: *The Protection of the Patient in Surgery of the Thyroid.* *Surg., Gynec. & Obst.*, 1921, xxxii, 213.

The exophthalmic goiter patient should be protected against the fatally excessive metabolism which the operation tends to induce, against failure of the already weakened myocardium, and against acidosis.

The abnormal sensitization of the cells in exophthalmic goiter cases makes necessary the protection of local anæsthesia even if surgical anæsthesia also is employed. The sensitized patients require protection against the stimuli of infection and in extreme cases must be guarded against even the absorption of aseptic wound secretion and hæmoglobin. In brief, they must be guarded against psychic, traumatic, biochemical, and anæsthetic stimuli and the effects of the secretion of the thyroid itself.

Whether the operation is to be performed with the patient in bed or in the operating room, he should see on the day of operation only the already familiar anæsthetist and the already familiar anæsthetic apparatus—no surgeon, no preparation, and no operating room. The end to be achieved is the maintenance of an unbroken state of negativity while the

exquisitely sensitized organism is being carried through the processes of the ligation of an artery and the removal of a part of one or both lobes of the thyroid.

Protection against suboxidation is also essential. The internal respiration is immediately dependent upon a continuous supply of oxygen; hence asphyxia or deep inhalation anæsthesia quickly suppresses the internal respiration and causes death immediately, within a few hours, or within a day or so. Gas and oxygen analgesia combined with local anæsthesia is entirely free from this serious objection.

A weak myocardium or a decompensated heart leads to serious suboxidation because of the diminished blood supply. Against this condition the patient is best protected by one or two courses of digitalis, each consisting of 30 minims of the tincture given every four hours for fifteen doses and repeated as may be required until œdema disappears and the tone of the heart is as good as its condition will permit.

Patients with advanced exophthalmic goiter commonly have cycles of vomiting. These may be controlled by sufficient water. It is probable that the clinician fails to appreciate the great loss of water through the skin and the fact that because of his raging metabolism the exophthalmic goiter patient requires much more water than a normal person.

There is evidence, although it is not conclusive, that protection should be given also against the too sudden withdrawal of thyroid activity. This danger may be eliminated by the administration of thyroid extract before the operation. If 2 gr. are given the evening before, and 2 gr. on the morning of the operation, the dose will become effective at the time the thyroidectomy is performed. If the patient later seems apathetic, it is well to continue the administration of the thyroid extract for several days. The necessity of preventing a sudden decrease in the amount of the thyroid hormone is supported by the fact that the safest operation is a graded operation: first, a ligation of one superior thyroid artery; then, of a second; and finally, after an interval, the length of which is determined by the needs of the patient, a unilateral or a bilateral partial thyroidectomy.

In the very severe cases in which the pulse runs up during the operation the wound is left open to protect the patient from the absorption of wound secretions and from postoperative pain, and also to shorten a hazardous operation by a few but possibly decisive minutes. Following ligation, protection against postoperative pain is secured by means of quinine and urea hydrochloride. The open wound is protected by flavine gauze dressings or by sterile dressings, which are nearly as good, until its closure under analgesia on the afternoon of the same day or on the following morning.

Finally, the patient must be protected against the so-called postoperative hyperthyroidism. If the pulse and the temperature begin to rise and restless-

ness is marked, ice-bags should be applied in approximately the following manner:

If the temperature reaches 101 degrees, four ice bags should be applied to the thorax and the extremities; at 102 degrees from eight to twelve ice bags should be applied to the thorax, the abdomen, and the extremities. If the temperature rises to 103 degrees or over, it should be reduced by refrigeration by placing the patient between rubber sheets placing on the upper sheet from 150 to 200 lb. of cracked ice, and mounting an electric fan at the foot of the bed so that the air current is directed toward the patient's face. In cases of great urgency, salt may be added. The temperature should be closely watched while the patient is in the ice-pack and the ice-pack should be removed when it has fallen to 100 degrees.

The formulation of this plan of treatment is based upon experimental research and the clinical study of a series of 821 ligations and 2,771 thyroidectomies. Of the latter, 1,315 were done for exophthalmic goiter.

By the application of these measures the mortality rate of all thyroidectomies has been reduced to 1.3 per cent; that of thyroidectomies for exophthalmic goiter, to 1.8 per cent; and that of ligations, to 0.6 per cent. The author's final series of cases included 322 thyroidectomies and 139 ligations without a death.

G. W. HOCHREIN.

Seelig, M. G.: Midline Congenital Cervical Fistula of Tracheal Origin. *Arch. Surg.*, 1921, ii, 338.

The author states that the case of congenital midline cervical fistula of tracheal origin reported in this article disproves the universal belief that all such fistulae are thyroglossal-duct anomalies. The tissues which were dissected out in closing the fistula were examined histologically and the diagnosis was made on this basis. The arrangement, in almost typical fashion, of all the histologic elements forming the trachea justified this diagnosis. The formation of such a fistula is explained thus:

"An anomalous budding process takes place at some point on the ventral or lateral aspect of the primitive trachea. As the primitive trachea develops into its definitive form, the anomalous sprout grows downward in a plane anterior to the sternum. Ludwig Pick suggests that this is not a budding process but rather should be interpreted as a double tracheal anlage, with the accessory trachea taking a course anterior to the sternum. At the point of budding or division, the anterior branch loses its connection with the foregut (from which the tracheal and lung anlage developed), becomes closed off, and gradually dilates to cystic proportions. The cyst stretches the overlying skin in the midline. Finally rupture occurs, establishing a fistula and resulting in skin retraction in the shape of folds, or possibly teats, as in the present instance." O. M. ROTT.

SURGERY OF THE CHEST

HEART AND VASCULAR SYSTEM

Meyer-Pantin: The Healing-In of Needles in Heart Wounds (Zur Frage der Einheilung von Nadeln im Herzen). *Frankfurt. Ztschr. f. Path.*, 1920, xxiv, 466.

Meyer-Pantin reports a case in which a needle 4.3 cm. long healed up in a heart wound without causing any symptoms. It was found by chance at autopsy on a man who died of pulmonary tuberculosis. In connection with this case similar cases reported in the literature are discussed.

There are three routes by which needles may enter the heart: (1) from outside through the skin, (2) from the œsophagus, and (3) through the respiratory tract.

Among 8 cases in which the location of the needle was known, it was found in the left ventricle in 5. This fact was due, the author believes, to the topographical anatomy of the heart. The œsophagus makes a bend at the point where it lies nearest the left ventricle and this is the point where it is easiest for a needle to penetrate.

The entrance of needles through the skin into the left ventricle is explained by the heart action. Of all the heart cavities the right ventricle has the greatest surface nearest the anterior wall of the thorax. On systole the heart makes a turn in the direction of supination of the hand so that the left ventricle is

brought nearest the outer chest wall and offers a greater surface for the penetration of a needle. The suction of the systole then tends to draw the needle into the heart.

In most of the cases the needle lies in a perpendicular longitudinal direction. Among pathological-anatomical changes caused by a needle in and around the heart are adhesions of the pericardium to the heart, the formation of a connective-tissue shell around the needle, and finally, thickening of the endocardium. Cases have been reported in which a needle remained in the heart for periods of fourteen, nine, and five years and twenty-two months. In 12 cases the entrance of the needle into the heart caused death in a short time. Death was due to external bleeding and in one case to gangrene of the leg resulting from embolism. In the latter case the needle projected into the left ventricle, caused the formation of thrombi, and became rusted by the oxygen in the blood. ROTHFUCHS (Z).

Jonnesco, T.: Surgical Treatment of Angina Pectoris by Resection of the Cervicothoracic Sympathetic Nerve (Traitement chirurgical de l'angine de poitrine par la résection du sympathique cervicothoracique). *Presse méd.*, Par., 1921, xxix, 193.

The symptoms of angina pectoris are caused by irritation of the cardio-aortic plexus due to a constant lesion of the aorta. The painful vascular and

motor disturbances which make up the syndrome are reflex. The circulatory, nervous, and muscular disturbances can be produced only if the reflex starting from the aortic plexus ends in the nerve centers.

By breaking the centripetal route between the cardio-aortic apparatus and the nerve centers by resecting the cervico-sympathetic nerve the arrival of the aortic reflexes in the nerve centers and the reaction of these centers are prevented.

Jonnesco in 1896 for the first time made a total resection of the cervical sympathetic, including with it the first thoracic ganglion. He did this in the treatment of epilepsy and exophthalmic goiter. The same operation was later performed for glaucoma and migraine. In 1916 it was applied to a case of angina pectoris, the first and only case of this condition treated surgically. A definite cure resulted. The resection of the cervico-thoracic nerve was done on the left side only. It might be thought, and Jonnesco himself so thought, that such a unilateral resection would not be sufficient to obtain complete isolation of the cardio-aortic plexus from the nerve centers. The practical result, however, proved the contrary. This might be explained by the fact that all the painful symptoms of angina pectoris are limited to the left half of the thorax and the left arm. It was for this reason that Jonnesco began the operation on the left side.

Because of the brilliant result obtained by the unilateral operation in the case reported Jonnesco believes that a resection on one side, the left side, will usually be sufficient to obtain a perfect result, but as the operation is simple and harmless, it is preferable to perform it on both sides.

W. A. BRENNAN.

MISCELLANEOUS

Lerche, W.: The Surgical Treatment of Suppuration in the Posterior Mediastinum; Report of a Case. *Surg., Gynec. & Obst.*, 1921, xxxii, 232.

In the case reported the peculiar cough and attacks of dysphagia which had persisted for six years, the increasing severity of the symptoms in the three to four months preceding the operation, and the final formation of a large abscess followed by complete cure suggested a local nerve irritation. In the author's opinion it is probable that the right recurrent chain of lymph nodes had become infected and caused irritation of the recurrent laryngeal nerve.

Examination of the patient showed atrophic rhinitis and a dry, glazed appearance of the pharynx and the cervical portion of the œsophagus. As the recurrent chain of lymph nodes receive the lymph trunks draining the upper end of the œsophagus, the already chronically inflamed mucosa of the upper end of the œsophagus was probably the avenue of entrance of the infection.

In several reported cases the pus was found in the retro-œsophageal space and extended into the

posterior mediastinum. In the author's case the pus was not retro-œsophageal, but had probably followed the groove between the œsophagus and the trachea.

In order to determine the probable route which would be taken by a liquid mass introduced into the upper part of the groove between the œsophagus and trachea, barium suspended in buttermilk was injected with moderate and gradually increasing force into fresh cadavers. The liquid mass extended laterally along the œsophagus and trachea into the superior mediastinum and a few centimeters below the tracheal bifurcation into the posterior mediastinum. It also followed the vessels, and when greater force was used it crossed in front of the trachea to the opposite side.

The number of cases thus far operated upon is ten, and in six a complete recovery followed cervical mediastinotomy. If cervical mediastinotomy should prove insufficient, it should be supplemented by dorsal drainage. As there is probably less liability of tearing the pleura, the Heidenhain operation would perhaps be the procedure of choice in draining dorsally.

I. W. BACH.

Fishberg, M.: The Diagnosis of Intrathoracic Neoplasms. *Med. Rec.*, 1921, xcix, 513.

During the past five years 33 cases of primary malignant neoplasms of the bronchi, lungs, and pleura have been admitted to the Montefiore Hospital. Complete autopsies have been obtained in 16, and in 3, surgical autopsies. All but one were diagnosed before autopsy.

The insidious onset of the condition with cough, expectoration, pain in the chest, dyspnoea, fever, and hæmoptysis, and the physical signs, which are usually those of a localized airless area of lung tissue, are responsible for the fact that a large number of cases are mistaken for pulmonary tuberculosis. In 50 per cent serous, sanguinous, or purulent pleural effusions occur, and for this reason a large proportion are treated as pleurisy. In the later stages, when the tumor disintegrates, cavities are formed in the lungs and foetid sputum is expectorated; thus abscess or gangrene of the lung is simulated.

There are two early symptoms which are hardly ever seen in early phthisis, namely, dyspnoea and pain in the chest. The dyspnoea is due to the plugging of a large bronchus from within or without. Asphyxia from pressure of the growth on the main bronchus or trachea was present in 2 cases. Pressure on veins may cause œdema of the upper part of the chest, the neck, and the face. Stridor is very rare.

Next to dyspnoea, pain is a constant symptom. Fever occurs early in the majority of cancer cases. Enlargement of the superficial glands is a late symptom.

The diagnosis is made by physical exploration of the chest. In the author's experience, such examination is more often decisive than any other diagnostic

method. In many cases a small tumor nodule is more easily and much earlier discerned by percussion and auscultation than by a roentgenological examination.

Many tumors break down. The patient then expectorates large masses of sputum, has profuse hemorrhages, runs a high fever, sweats, etc.

Secondary effusions accumulate very rapidly and completely fill the chest. Examination of the pleural exudate has been of little value.

Patients with enlarged tuberculous glands on the neck hardly ever have signs of active disease in the

lungs, but when the glands are malignant there are signs of extensive changes in the lungs.

In 3 of the cases cancer cells were found in the sputum.

Radiography has been found of value in cases of lung tumor but often proves misleading or negative. A radiogram made immediately after the withdrawal of the fluid will show a tumor which is otherwise obscured by the fluid. Recently it has been the author's custom to withdraw the fluid and produce a pneumothorax. A radiogram then shows the tumor clearly.

C. R. STEINKE.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Hennington, C. W.: Abdominal Incisions. *N. York State J. M.*, 1921, xxi, 81.

In making abdominal incisions the chief consideration is preservation of muscle tissue and nerves. The length and direction of the incision should be determined by the anatomical arrangement of the muscles and nerves.

The McBurney incision conforms to all the principles of an ideal incision and would be more favored but for its abuse in careless separation of the layers and needless trauma to the nerves which accounts for the occasional occurrence of inguinal hernia as a sequel.

A muscle-spreading incision through Petit's triangle is the best method of approaching the retroperitoneal region, including the kidney and ureter as well as the appendix known to be retrocaecal.

The possibility of making a true muscle-splitting incision for approach to the upper abdomen is doubtful, particularly in the gall-bladder region. The distribution of the nerves offers the chief difficulty.

The transverse incision is of doubtful value; it lends itself poorly to any needed alteration and offers greater mechanical difficulties to its proper performance and closure than the classical longitudinal incision.

The direct, split-rectus incision (through muscle and sheath) remains the method of choice since the medial portion of the split-rectus muscle readily recovers and the nutrition, both of the muscle and the sheath, is less disturbed when their normal relations are not interfered with.

The low middle-line incision remains the incision of choice for the lower abdomen.

Increased length of any incision permits more thoroughness, ease, and speed at operation with less trauma to the tissues, but gives greater danger to innervation and greater potential danger of a weak scar.

In closures, accurate apposition in each anatomical layer with freedom from blood and dead space is important.

Pain in abdominal scars is produced either by involvement of nerves in the scar or by traction caused by the denseness of the scar. Most painful scars extend through all the layers of the abdominal wall and prevent their gliding normally over each other. In diagnosing such cases one must exclude peritoneal adhesions and hernia as causes of the pain.

The aim in abdominal closures is not merely the prevention of a hernia but also the attainment of as good an anatomical and functional reconstruction as possible.

B. F. EAGER.

Pineda, J. C.: Fibrosarcoma of the Abdominal Wall (Fibrosarcoma de la pared abdominal). *Rev. de med. y cirug. de la Habana*, 1921, xxvi, 35.

Fibromata of the anterior abdominal wall may be hard or soft and may undergo degeneration. Sarcomatous degeneration, however, is very rare. The case reported in this article is of interest because of the rarity of fibrosarcomata of the abdominal wall and the early successful removal before metastasis had taken place.

The tumor was situated in the hypogastric region. It was of several years' duration and had increased progressively in size until it was about that of the patient's fist. It was soft, projected from a sessile base, and was largest in its transverse diameter. Biopsy showed it to be a fibrosarcoma.

The tumor was removed in October, 1919, by two transverse elliptical incisions and complete excision. Healing took place by primary intention and convalescence was uneventful. Three years later there had been no recurrence and the patient's health had continued good.

W. R. MEEKER.

Tourneux, J. P.: Strangulated Pre-Hernial Lipomata (Les lipomes préherniaires étranglés). *Rev. de chir.*, Par., 1920, lviii, 653.

It is known that adipose formations may develop about any potential hernial orifice in the organism. Therefore because of their situation they cause traction on the peritoneum and prepare the way for hernia by creating a kind of infundibulum. These lipomata occur often about the linea alba and in the femoral region. Much less frequently they develop in the inguinal region. The phenomena

arising from them simulate those due to a true hernia. They may even resemble those of strangulated hernia. The diagnosis is often extremely difficult, particularly when the tumor is hard and painful.

The differentiation between prehernial lipomata and true hernia was reported in surgical literature as far back as 1821 but was overlooked until recently.

The author gives the histories of 4 cases observed by him in which the different stages of strangulation from simple blood stasis up to gangrene were noted. Sections are devoted to the etiology, pathologic anatomy, symptoms, diagnosis, and treatment. The differentiation between strangulated lipoma and strangulated hernia is difficult. The strangulated lipoma is very hard, non-impulsive, and irreducible. The strangulated hernia is not mobilizable but the lipoma shows relative mobility. The intestine or omentum is attached to the hernial orifice and enclosed in a sac more or less intimately connected with it which is itself encircled by the fibrous ring. The lipoma is almost an isolated tumor situated at the extremity of a diverticulum and not enclosed in a sac. Its greater mobility is due to the fact that most of it is completely free. The observation of this mobility enabled the author to reach a correct diagnosis in 3 cases. Tourneux believes that many cases operated upon as strangulated hernia are in reality cases of strangulated lipomata.

There is only one rational treatment of strangulated lipoma, viz., total extirpation. Traction is not only useless as a rule but may be a source of danger as the lipoma may be infected or may rupture. After the lipoma and the agent of strangulation have been dealt with the peritoneal diverticulum must be eradicated. The complete treatment therefore consists in extirpation of the lipoma and of the sac or pedicle which is always present in the midst of the adipose tissue. W. A. BRENNAN.

Stetten, D.: The Differentiation of Saphenous Varix from Femoral Hernia. *Surg., Gynec. & Obst.*, 1921, xxxii, 235.

Dilatation of the terminal portion of the saphenous vein near its entrance into the femoral vein is frequently mistaken for a femoral hernia. In some cases the dilatation is of considerable size and when the patient is standing may easily be seen as a protruding mass in approximately the location of a hernia through the femoral canal. It is often painful and symptomatically very readily suggests such a hernia.

As differentiating saphenous varix de Quervain called attention to a bluish sheen to the skin over the swelling, easy compressibility, prompt reappearance of the dilatation upon the release of pressure, and fluctuation in its size with every change in the venous pressure due to coughing, vomiting, lying down, or normal breathing.

Stetten states, however, that the bluish appearance is absent if the subcutaneous fat is at all pronounced, while the compressibility of the dilatation,

its enlargement with the increase in venous pressure due to coughing, and its disappearance in the recumbent position may be simulated by a hernia. He adds, however, that the position of the swelling in the dilatation of the upper part of the saphenous vein is usually somewhat lower down than a femoral hernia. While it may be at the saphenous opening, just at the entrance of the internal saphenous into the femoral vein, it is generally a centimeter or two below this juncture. As a rule other varicose veins will be found on the leg and thigh when a dilatation is present near the saphenous opening.

Reduction of the tumor and pressure over the femoral ring by the examining finger does not hold back a saphenous varix when the patient strains or stands. The impulse on coughing also differs materially in the two conditions. Instead of a frank impulse, as in a hernia, a fluid wave or thrill is felt in cases of venous dilatation. This is readily elicited if only light pressure is made during the examination, and is almost pathognomonic. It can be simulated in hernia only if there is an associated ascites.

I. W. BACH.

GASTRO-INTESTINAL TRACT

Losio, L.: Ptosis of the Pyloric Part of the Stomach and Biliary Colic (Ptosi della pars pilorica dello stomacho e coliche biliari). *Policlin.*, Roma, 1921, xxviii, sez. prat., 253.

The varied symptoms of ptosis of the liver include painful paroxysms with or without icterus which simulate the biliary colics of lithiasis. Similar colicky pains may occur also in cases of so-called vertical dislocation of the stomach with evident descent of the pyloric region.

Losio describes two clinical cases to show that if a total descent of the liver is associated with descent of the pyloric region of the stomach exaggeration of the gastric curvatures and angulation of the free parts of the neck of the gall-bladder and common duct give rise to painful crises. These are due mostly to traction on the bile ducts. In some cases, however, such as one of those reported in this article, there is relaxation due to a reduction of the distance between the hepatic hilum and Vater's ampulla.

W. A. BRENNAN.

Vaccari, L.: Mediogastric Stenosis Caused by Incomplete Indirect Umbilical Hernia (Stenosi mediogastrica determinata da ernia ombelicale indiretta incompleta). *Policlin.*, Roma, 1921, xxviii, 225.

The author describes the case of a woman 50 years of age in whom the clinical symptoms and the X-ray findings led to a diagnosis of mediogastric stenosis due probably to an ulcer of the lesser curvature of the stomach. At operation an incomplete hernia in Richet's umbilical canal was discovered.

It is known that Richet's umbilical fascia forms the umbilical canal and that a hernia there may progress from above downward or from below up-

ward according to the arrangement of the fascia. Widening of the canal can occur only in its initial portion; the hernia cannot reach the umbilicus but must remain between the linea alba and the fascia.

The symptoms arising from a hernia of Richet's canal generally resemble those of gastric ulcer but gastric ulcer is more frequently associated with gastric hæmorrhage. In the author's case there was no gastric hæmorrhage but its absence did not exclude the possibility of ulcer.

Vaccari states that his case of mediogastric stenosis due to a Richet hernia is unique in medical literature. He draws the following conclusions:

1. When the X-ray demonstrates a mediogastric stenosis, latent or incomplete hernia of the umbilical canal of Richet must be considered in seeking the cause.

2. When the diagnosis between gastric ulcer and umbilical or epigastric hernia is doubtful the clinical findings should be relied upon more than the X-ray examination.

3. When a case resembling mediogastric stenosis lacks some symptom characteristic of this lesion the presence of an indirect, incomplete hernia of the umbilical canal of Richet should be suspected.

W. A. BRENNAN.

Borchers, E.: The Value of Resection of the Vagus Nerve for Disturbances of Gastric Motility (*Motilitätsstörungen des Magens und Vagusresektion*). *Zentralbl. f. Chir.*, 1920, xlvii, 1535.

This is a short review of experimental work designed to clear up the question of the influence of the vagus nerve on the activity of the normal and diseased stomach. The author took up this investigation because of the recent recommendation of section of the vagus nerve for the treatment of gastric crises. He points out that such an operation would have an effect on gastric spasms and hypermotility only if the vagus nerve is active in producing these conditions. On the basis of the recent literature regarding ulcer and vagotonia this participation appears to have been proved beyond doubt, but from numerous experiments on cats and rabbits in which an opening was made in the stomach and abdominal wall, Borchers has come to the conclusion that the vagus nerve is not to be regarded as the motor nerve of the stomach. Therefore he advises against all operations designed to cure hypermotility of the stomach by weakening or cutting of the vagus.

KALB (Z).

Mayo, C. H.: Gastric and Duodenal Ulcers. *Ann. Surg.*, 1921, lxxiii, 328.

The author believes that the accident of peptic ulcer is rare and represents but a fraction of 1 per cent of the findings of general necropsies. In the aggregate, however, the condition occurs in thousands of persons, many of whom apparently never suffer from symptoms of gastric origin while others do not appreciate their symptoms. When acute and chronic bleeding, perforation, and mechanical

obstruction were the main diagnostic points of ulcer, hæmorrhage was formerly relied on in making the diagnosis. These symptoms lost their importance, however, as diagnostic ability improved.

Peptic ulcer is more common in males than in females, the proportion being 3 to 1. The proportion of gastric to duodenal ulcers is approximately 1 to 4, as shown by reports from the Mayo Clinic where from January 1, 1906, to January 1, 1920, operations were performed on 1,191 patients with gastric ulcer and on 4,532 patients with duodenal ulcer. In a series of 638 patients with gastric ulcer observed in a five-year period, 28 had multiple ulcers.

Peptic ulcer is undoubtedly developed by a combination of local chemical effects which possibly cause prolonged vessel spasm or claudication, a counterpart of Raynaud's disease or scleroderma. It may be due also to direct interference with the circulation by infarction emboli of bacteria chemically and mechanically active in the tissues which thereby lower the local resistance to the action of digestive fluids. The relation of pepsin and acid has always been recognized as associated with the development of these so-called peptic ulcers.

The medical treatment of gastric ulcer in an exacerbation during waking hours is directed toward controlling and lowering the acidity by dilution or neutralization of the gastric contents at regular periods.

Some surgeons perform gastro-enterostomies because of symptoms such as digestive, abdominal, and even spinal reflexes without positively determining the presence of ulcer. In a number of cases it is necessary to cut off and close the gastro-enterostomy which was made to the discredit of surgery when no ulcer was present. On the other hand, the surgeon appears to discredit the internist as he never sees an ulcer in the early stage unless it has perforated or is causing hæmorrhage; he thus may exaggerate the danger of ulcer. Although the patient may have passed years in the active care and treatment of his stomach, the gastric trouble cannot be overcome as it is reflex in origin.

In a study of the results of 647 operations performed in the Mayo Clinic from July 1, 1914, to July 1, 1919, on 638 patients with calloused ulcer of the stomach, the average mortality was 3.2 per cent; this is more than double the average mortality in 2,734 operations performed in the same period on 2,720 patients with duodenal ulcer. Many excised ulcers which were believed to be benign showed the presence of carcinoma in a limited area of the margin. On the theory that malignant cells are much more vulnerable to heat than normal cells, Balfour suggested and developed a slow destruction of ulcer by perforation with the cautery and immediate closure and gastro-enterostomy.

In 89 operations performed in the Mayo Clinic for hour-glass stomach the operative mortality was 7.4 per cent. The sleeve resection of the central

portion of the stomach, usually with gastro-enterostomy, is performed. If there is recurrence, the lower half is removed at the second operation, the narrowed proximal portion being united usually to the jejunum but sometimes to the duodenum. As a rule the same type of union of the stomach with the duodenal end or the jejunum is made for extensive ulceration and thickening and for local cancer in the pyloric region after resection of the stomach.

Gastrojejunal ulcer occurs in a small percentage of patients who have been primarily relieved by gastro-enterostomy. The present small percentage of these cases can be markedly reduced by avoiding the use of permanent suture material for the brief period demanded in the ordinary case of gastro-enterostomy.

In an investigation of 438 cases of duodenal ulcer Graham found that 70 per cent of the patients who survived the operation considered themselves well following gastro-enterostomy, 27 per cent were improved, and 3 per cent unimproved.

The future condition and length of life of patients with peptic ulcer are problems recognized by insurance companies in considering the applications of those who have had operations for ulcer. In an investigation at the Mayo Clinic of the results of operation in a large series of cases of gastric and duodenal ulcers, Hunter, actuary of the New York Life Insurance Company, found that among patients with gastric ulcer the average death rate for the four-year period after operation was slightly more than three times the normal, while among patients with duodenal ulcer it was, if anything, slightly less than normal. The series consisted of 2,431 patients, all but 108 of whom were traced.

Westphal, K.: Contraction of the Stomach and Its Relation to the Chronicity of Peptic Ulcer (Ueber die Engen des Magens und ihre Beziehungen zur Chronizität der peptischen Ulcera). *Mitt. u. d. Grenzgeb. d. Med. u. Chir.*, 1920, xxii, 659.

The forms of contraction of the stomach described by pathologists, particularly Aschoff, are not very well known to roentgenologists because the former make their findings with the cadaver lying on the back and the latter with the patient standing or sitting. Therefore Westphal gave a bismuth meal to 24 patients, some of them lying down, some of them standing, and some of them sitting, and examined them roentgenologically in these positions.

When the patients were lying down the meal remained longer in the fundus, not because of a contraction of the stomach at a lower point, but because in the recumbent position the upper part of the stomach lies at a lower level than the pylorus and the muscle layer of the fundus is weaker and yields more readily to the pressure of the gastric contents. The contents then pass, sometimes very suddenly, sometimes more gradually, downward into the sinus region. Generally in the region

described by Aschoff as being contracted a smaller stomach silhouette is observed so that on the whole the roentgen pictures in the recumbent position do not contradict the anatomical findings.

In the upright position the weight of the contents changed the stomach into the usual fish-hook form; also in patients observed as soon as possible after they arose from the table there was generally no contraction of the lower part of the body of the stomach.

Aschoff found that the constriction could sometimes be observed in the active stomach by feeding special kinds of food. Westphal therefore gave 3 patients goulash made of large pieces of meat with a great deal of pepper, alternating this with tablespoonfuls of barium emulsion. However, when they were examined with the X-ray in the standing position both during the meal and thirty and sixty minutes afterward no isthmus-like circumscribed contractions of the stomach were noted. Other kinds of extremely irritating food also failed to cause these contractions.

Westphal describes the further course of the food through the stomach on the basis of Groedel's pictures and his own observations, mentioning especially the waist-like contraction at about the middle of the stomach, the region which is qualitatively and quantitatively exposed to greater mechanical irritation than other parts of the stomach. This "waist-line" of the stomach, especially in fish-hook and long stomachs, is caused, according to Westphal, by the elasticity of the stomach wall which causes it to yield in the middle like a rubber tube when it is stretched.

The longitudinal folds in the mucous membrane of the stomach depend on the degree of contraction of the stomach wall. Westphal compares them to the wrinkles in the palm of the hand when the hand is closed. In the examination of 50 plates with ulcer niches he found most of the niches at the boundary between the middle and lower thirds of the lesser curvature; at the isthmus described by Aschoff they were much rarer, the majority being higher than that, i. e., at the "waist-line" of the stomach. Mechanical factors and nervous spasms contribute to the maintenance and development of the ulcer.

Westphal discusses the origin and effect of spasms of the stomach in pyloric, parapyloric, and duodenal ulcers. Possibly the periodicity of duodenal ulcer is explained by disturbances in the function of the vegetative nervous system which appear especially at certain seasons of the year. In experiments on rabbits in which the stomach mucous membrane was pricked with long needles Westphal found that the part of the stomach wall affected became pale, and that small, isolated muscle contractions, the largest the size of a lentil, appeared on the lesser curvature and in the pyloric region but were most marked in the lower segments of the stomach. He believes that solid bits of stomach contents have a similar effect on a gastric ulcer, producing isolated or diffuse spasms of the stomach wall.

While it is generally thought that there is a gradual transition from small hæmorrhages of the mucous membrane to hæmorrhagic erosions and then to peptic ulcers, Westphal concludes on the basis of the finding at autopsy of an apparently recent stomach ulcer (which however, he did not examine with extreme care) and from the experiments of Gundelfinger, that sometimes in man large peptic ulcers develop within a few hours, perhaps as the result of disturbances in the region of the mesenteric plexus. The origin and chronicity of peptic ulcer, therefore, is due to the interaction of different causes, anatomical, mechanical, and nervous.

MARWEDEL (Z).

Toupet, R.: Posterior Transmesocolic and Supra-mesocolic Gastro-Enterostomy (La gastro-entérostomie postérieure trans- et sus-mésocolique). *Presse méd.*, Par., 1921, xxix, 253.

Toupet is becoming more and more convinced of the superiority of trans- and supra-mesocolic gastro-enterostomy over posterior gastro-enterostomy. When the former is performed in simple cases it is not necessary to bring the transverse colon to the surface of the body. In difficult cases it allows the surgeon to operate outside the abdomen, to place the neostomy in a good position, and to utilize the transmesocolic route when this would otherwise be impossible. It seems to Toupet always more logical to bring the small intestine to the stomach. The point open to most question is the best method of opening the posterior omental cavity. Toupet's method is as follows:

If the operative indication is clear, if exploration of all the posterior surface of the stomach is not necessary, and if the gastro-enterostomy is only the first stage of a gastrectomy, the gastrocolic ligament is depressed with the finger and the posterior wall of the stomach is exposed. If a very wide exploration of all the posterior wall of the stomach is necessary the intercolo-omental exposure of Duval is done. If pyloric exclusion by section is indicated and there is no suitable area on the posterior wall of the stomach to make the anastomosis the greater curvature is stripped of its vessels in the manner recommended by Témoïn.

W. A. BRENNAN.

Kloiber, H.: The Hydrochloric Acid Content After Resection of the Stomach for Callous Ulcer (Die Salzsäureverhältnisse nach Resektion des Magens wegen Ulcus callosum). *Med. Klin.*, 1921, xvii, 36.

Kloiber performed 15 operations for penetrating callous ulcer, 6 by the Billroth II method and 9 by simple transverse resection. In all of these cases he determined the gastric acidity before the operation and two and four years afterward. In every instance he found a marked decrease in the acid content below the normal values, and in some cases an anacidity. The total acidity and the hydrochloric acid content decreased in about the same proportion.

As the decrease in acid values was present in the cases of transverse resection as well as in those

treated by the Billroth II method, and as pyloric insufficiency was excluded by the fact that there was no bile in the stomach, the decrease in acidity cannot have been due to neutralization of the gastric juice by duodenal contents, but must have been a primary decrease in acid production resulting from the decrease in the secretory mucous surface of the stomach and a disturbance of innervation caused by the cutting of the vagus nerves. These deductions were not confirmed by experiments on animals probably because the conditions in dogs are not just the same as those in man. In man there is no doubt that the acid values are decreased by resection. Therefore, this operation is of great therapeutic value not only because it removes the ulcer, but also because it overcomes the hyperacidity.

HAGEMANN (Z).

Maydl, V.: Tuberculous Stenoses of the Bowel (Tuberkulose Darmstenosen). *Časop. lékař. česk.*, 1920, lix, 777.

In this article the author discusses the pathogenesis, diagnosis, and therapy of tuberculous stenoses of the bowel and reports the cases he has operated upon during the past sixteen years. Of 19 cases of stricture of the small bowel 2 were complicated by tuberculosis of the cæcum. In one of these cases an acute ileus (volvulus) with six separate strictures of the small bowel had persisted for eight days. This patient died. The bowel was resected in 15 cases and in 6 the length of the resected portion was greater than 1 mm.

Of 18 patients with chronic tuberculosis of the small intestine without ileus, 85 per cent recovered and 3 died. Resection for ileocæcal tuberculosis in 26 cases was followed by recovery in 20 cases and death in 6. In 31 cases of cæcal tuberculosis the unilateral exclusion of the bowel with anastomosis of the small and large intestines was performed. A recovery resulted in 29 cases and death in 2, the mortality being therefore 6.5 per cent. In 9 cases only an exploratory laparotomy was done and there were no operative deaths.

The end-results in 85 cases were an operative cure in 83 per cent and death in 17 per cent. In the non-complicated cases of chronic tuberculous stenoses of the bowel an operative cure was obtained in 86½ per cent.

KINDL (Z).

Davison, C.: Intermittent Obstruction Due to Gastropptosis. *Surg., Gynec. & Obst.*, 1921, xxxii, 184.

When gastropptosis is so marked that it angulates the first portion of the duodenum, temporary obstruction may result. The second portion of the duodenum is the most fixed point over which angulation of the first portion may occur.

The clinical history includes the usual symptoms of viceropptosis, but usually the debility and emaciation are greater. Attacks of temporary obstruction of apparently the upper intestine occur at intervals varying from a few hours to several days. During

such attacks there is paroxysmal pain in the epigastrium. Vomiting of stomach contents and regurgitation of bile occur. The vomitus sometimes contains blood. Generally constipation is present. The attacks usually subside after free emesis.

As a rule the Ewald test meal shows high acidity and the absence of lactic acid, Boas-Oppler bacilli, and sarcinæ. Occasionally it shows blood and bile. There is usually a slight leucocytosis.

The logical treatment of obstruction is the removal of the cause if possible; failing this, a visceral anastomosis should be made to pass the obstruction. Some of the methods suggested to support the stomach so that the duodenum cannot kink on itself would seem to be ideal, but are not sufficient. Posterior gastro-enterostomy appears to be necessary when the gastropexia produces intermittent obstruction.

Two cases are reported. In one, that of a woman 42 years of age, the roentgenoscopic examination showed an enlarged stomach prolapsed into the pelvis, good peristalsis of the stomach, but little or no filling of the duodenum.

Posterior gastro-enterostomy was performed and three years after the operation the patient was in good health and had gained 110 lb. A roentgenogram at this time showed the stomach well out of the pelvis and emptying rapidly through the gastro-enterostomy but not through the duodenum.

Also in the second case, that of a man aged 44, the roentgenogram showed a large stomach prolapsed into the pelvis and no filling defect of the duodenum.

A posterior gastro-enterostomy was performed. Five years later the patient was free from symptoms and had gained 64 lb. Roentgenoscopic examination showed the stomach emptying rapidly through both the gastro-enterostomy and the duodenum.

M. I. MALONEY.

Gallo, A. G.: Intestinal Obstruction Due to Biliary Calculi (Obstrucción intestinal por cálculos biliares). *Semana méd.*, 1920, xxvii, 854.

Gall-stones causing intestinal obstruction have been found in only three cases. Two of the patients were women 75 and 65 years of age respectively, and one, a man 55 years of age. In two cases the obstruction was produced by a single stone, while in the third it was due to one large stone and several smaller calculi.

Gall-stones of sufficient size to produce intestinal obstruction usually reach the bowel by ulceration instead of passing through the common duct. As a result of the chronic cholecystitis, peritoneal adhesions to the surrounding structures are formed, especially to the duodenum because of its closer location. In one case an ulcerated opening 3 cm. in diameter connected the gall-bladder with the second portion of the duodenum. In the second case no vesico-intestinal fistula could be found. In the third case the patient's condition was too grave to permit exploration.

As a result of the mechanical action of the gall-stones and the influence of the septic contents of

the gall-bladder, necrosis of the partition separating the gall-bladder and intestinal lumina forms a fistula of large size. Such a fistula may connect the gall-bladder with the hepatic flexure of the colon.

The mechanism of the ileus is not entirely that of impaction, but also that of spasm of the intestinal wall. Therefore stones of smaller size than the intestinal lumen may cause obstruction. Spasm may persist even after the removal of the calculus.

Symptoms of a violent cholecystitis with acute colic, syncope, and sometimes melena or hæmatemesis usually indicate the passage of the stone into the digestive tract. If intestinal obstruction results, there is an acute onset of vomiting, hiccough, and suppression of fæces and flatus. Pain is at first diffuse but later has a tendency to localize, usually in the right flank where it is often confused with appendicular colic. Vomiting is at first reflex, but later becomes mechanical. Still later there may be violent contractions of the intestinal loops which usually produce visible peristalsis. The pain then increases and the vomiting becomes fæcal in character. Later there is severe toxæmia manifested by tachycardia, hypotension, dyspnoea, and severe general prostration. Necrosis and gangrene of the affected portion of the bowel may follow and lead to diffuse peritonitis from perforation.

In the treatment the lower bowel should be evacuated with oil enemas. Dehydration should be combated with injections of saline, rectal instillations, and gastric lavage. The condition may return to normal after three or four days but operation should not be delayed and when possible should be performed under local anæsthesia. W. R. MEEKER.

Schlesinger, E.: The Clinical Significance of Epigastric Diverticulum of the Small Intestine as Shown by the Roentgen Rays (Das epigastrale Duendarmdivertikel im Roentgenbild und seine klinische Bedeutung). *Med. Klin.*, 1920, xvi, 1256.

In examining a stomach by means of a bismuth meal for suspected ulcer Schlesinger found a solitary almond-shaped shadow in the intermediate layer which was covered by an air bubble. The shadow lay mesial to the lesser curvature and there was no constriction in the greater curvature. A similar phenomenon was observed once before by the author and twice by de Quervain, but has not been explained. Akelund also reported a case in which he saw a shadow of this type, but considerably larger, lying beside the stomach silhouette. The meal, after going through the duodenum, passed into the diverticulum. Nothing was found to account for the X-ray picture at operation, but autopsy showed a diverticulum in the upper part of the jejunum. In Schlesinger's case the diverticulum filled only after the meal had passed the pylorus; he was able to follow the meal through the duodenum into it. The diverticulum became filled to different degrees as the patient's position was changed. By suitable projection Schlesinger suc-

ceeded in separating the diverticulum shadow from that of the stomach. Clinically the symptoms were those of stomach ulcer.

The author believes that the diverticulum did not cause the symptoms from which the patient suffered but that it was the starting point of injuries which increased the tendency to ulcer formation and led to the formation of adhesions. The presence of a diverticulum alone is not an indication for operation; the treatment should be adapted to whatever other condition is associated with it.

HAGEMANN (Z).

Leveuf, J.: Chronic Occlusion of the Duodenum Due to Mesenteric Compression (L'occlusion chronique du duodénum par compression mésentérique). *Rev. de chir.*, Par., 1920, lviii, 616.

Leveuf has made an analytical study of the reported cases of duodenal occlusion due to mesenteric compression. This study shows undoubtedly that the cases are of two types. In one, the stomach is either not dilated at all or only slightly dilated, while in the second type gastric dilatation may be very formidable. It would be interesting to know the condition of the pylorus in both types. When a gigantic duodenum is found with a normal stomach it is evident that the pyloric sphincter has preserved its tonicity. Codman has reported pyloric incontinence, and Stavely, one case in which the stomach and duodenum were both dilated and the pylorus admitted four fingers. More than one-half of the cases of chronic duodenal obstruction due to mesenteric compression have their origin in some congenital malformation, mobility of the right colon being perhaps the most frequent cause. The other cases are secondary to a dilatation of the stomach which as a rule is associated with ptosis or aerophagia. In all, the development of the intestine has been arrested. Corresponding to both chronic types there are acute forms and a variety of intermediate clinical forms.

With regard to the treatment Leveuf makes the following statements:

1. Operation should not be resorted to until medical measures have failed.

2. If a congenital abnormal mobility of the colon is discovered, a colopexy and a duodenojejunostomy should be done.

3. If there is no mobility of the colon only a duodenojejunostomy is indicated.

The author gives the histories of 28 cases reported in the literature and 2 of his own.

W. A. BRENNAN.

Terry, W. I., and Mugler, F. R.: Diverticula of the Jejunum. *Arch. Surg.*, 1921, ii, 347.

A search of the literature has revealed only 19 cases of jejunal diverticula. It is known that diverticula may occur in any part of the intestinal tract, and that they are most frequent in the colon, less frequent in the ileum and duodenum, and least frequent in the jejunum and rectum.

Diverticula are classified as congenital and acquired, true and false. In true diverticula all of the intestinal coats are present, whereas the false type consist of hernial protrusions of the mucosa through the muscularis which carry the serosa as a covering. The congenital diverticula are usually true, and the acquired are usually false diverticula, but exceptions to this rule have been found. The most common congenital diverticulum is Meckel's diverticulum. This is usually found on the convex surface of the lower ileum, whereas the majority of the other diverticula appear near the mesenteric border or between the layers of mesentery. The condition responsible for acquired diverticula on the concave surface of the intestine is probably the weakening of the walls by the penetration of the blood vessels at the mesenteric border.

The fact that the jejunum is less subject to diverticula than the ileum is probably due to the fluid content, thicker wall, and larger lumen of the former. One case is reported.

I. W. BACH.

Burrows, W. F., and Burrows, E. C.: A Colostomy Operation. *J. Am. M. Ass.*, 1921, lxxvi, 647.

The incision for this colostomy is made through the skin, the subcutaneous tissue, and the anterior rectus sheath near the outer border of the left rectus muscle. It passes between the parallel fibers of the rectus muscle at about its outer third. It is 3 in. long and its upper extremity is at the level of the navel. A subcutaneous channel is then made on the anterior rectus sheath, extending from the primary incision downward and inward to about midway between the pubis and umbilicus, where a vertical skin incision $1\frac{1}{2}$ in. long opens into it.

Through the abdominal incision the sigmoid is sought and its proximal and distal segments are distinguished. It is brought through the rectus muscle with the proximal segment less redundant than the distal. Both segments of sigmoid are brought through the rectus muscle and through the subcutaneous channel. The peritoneal and muscle tissues are sutured above and below the exit of the bowel, and the latter is fastened with two silk sutures to the anterior sheath of the rectus. The skin incision is then closed.

Thereafter a special pressure apparatus is fitted with an opening over the colostomy and a small detachable rubber bag is supplied to collect any contents which may escape during the day. The belt part of the apparatus which passes around the pelvis is tightened as necessary and pressure is thereby exerted on the subcutaneous portion of the bowel.

M. H. KAHN.

Hollenbach, F.: Pseudo-Appendicitis Caused by Tuberculosis of the Mesenteric Lymph Glands (Pseudoappendicitis hervorgerufen durch Tuberkulose der Mesenteriallymphdruesen). *Deutsche med. Wchnschr.*, 1921, xlvii, 125.

The diagnosis of tuberculosis of the mesenteric lymph glands is very difficult except in those cases

in which the large packets of glands can be felt through the abdominal wall. The symptoms of the condition are varied, sometimes resembling those of a gastric or duodenal ulcer, sometimes those of ileus. Frequently they present the picture of an acute or chronic appendicitis, especially when the glands in the ileocaecal angle of the mesentery are involved.

Almost without exception there are no signs in the intestine of a fresh or an old process. The portals of entry show such slight lesions of the mucous membrane that they cannot be perceived macroscopically at all; moreover, the normal intestine may absorb tubercle bacilli without becoming infected, the visible changes appearing first in the mesenteric lymph glands. The results of animal experimentation agree with these practical findings.

Of the cases observed by the author the picture was that of an acute appendicitis in 4 and that of a chronic appendicitis in 2. All of the patients were young. At operation extensive swelling of the lymph glands of the ileocaecal mesentery was found. Some of the glands were calcified and beside them were others showing recent swelling. As there were no marked changes in the appendix, these changes could not be held responsible for the clinical symptoms. All lymphomata which could be reached were extirpated as thoroughly as possible, the peritoneum being split and the glands and gland packets shelled out. The hæmorrhage was controlled by ligation and the peritoneum closed by suture. As a rule the appendix also was removed. In the acute cases the fever and symptoms generally disappeared soon after the operation. In the after-treatment the patient was exposed to the sun at high altitudes.

On the basis of these cases the author recommends a search for tubercular lymph glands in the ileocaecal mesentery in all cases showing symptoms of acute or chronic appendicitis in which operation does not reveal any pronounced changes in the appendix.

BODE (Z).

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Willis, A. M.: The Removal of the Gall-Bladder without Drainage: Further Observations. *J. Am. M. Ass.*, 1921, lxxvi, 712.

Modern tendency is strongly opposed to the promiscuous use of drainage after operations on the pelvic or lower abdominal organs as it serves as a pathway for the entrance of infection, weakens the abdominal wall, protracts the convalescence, and promotes the formation of adhesions.

In cases of experimental peritonitis in dogs in which drainage was used a walling-up of the drain occurred within a few hours and seemed to prevent the drain from removing any of the peritoneal exudate. On the other hand, the cases in which closure was effected without drainage progressed fully as well as those in which drainage was used.

The arguments urged in favor of drainage or packing after cholecystectomy are that when there is persistent oozing of blood it might be unsafe to close without drainage and that infectious and other noxious material should be removed. In the author's opinion a dry pack left in for a short time effectually checks the oozing. In regard to the second argument he states that bile in the peritoneal cavity, unless present in enormous amounts, does not seem to endanger life, and that as a rule the greatest injury it may bring about is the formation of very dense adhesions.

The conclusion reached is that the omission of drainage after cholecystectomy is a perfectly safe procedure and the results obtained in such cases are distinctly superior to those following the older method of packing or draining with gauze.

I. W. BACH.

Balfour, D. C.: The Technique of Hepaticoduodenostomy. *Ann. Surg.*, 1921, lxxiii, 343.

The more common conditions giving rise to the necessity for reconstructive surgery of the bile passages may be classified as follows:

1. New growths, malignant or benign, usually occurring as duct carcinoma or cyst; stricture or rupture of some portion of the tract usually due to pressure or the passage of a gall-stone.

2. Injuries to the ducts during operation, such as stricture due to crushing or ligation; division or resection of a portion of the duct.

The number of cases of the first group is relatively small. The second group is of unusual importance because such injuries are by no means few, they occur most often during the operation of cholecystectomy, and are avoidable.

The failure to identify the common duct is the most common cause of such injuries. In the occasional cases of cholecystectomy in which there is difficulty in securing good exposure the liver is drawn downward and toward the median line and separated with a spatula from the abdominal wall. A gauze compress is placed between the superior right lobe of the liver and the chest wall just behind the hepatic duct. When traction is made on the gall-bladder the region of the hepatic and common ducts is well exposed. Occasionally it is advisable to remove the gall-bladder from without inward or after emptying it to split it longitudinally down to the opening of the cystic duct.

The second most common cause of injury is active hæmorrhage from the cystic artery or some anomalous branch of the hepatic artery. Blindly grasping for the retracted artery has not infrequently resulted in a crushed common or hepatic duct. The various anatomical anomalies of the bile ducts and related blood vessels are mentioned as a contributing cause.

The most common injury is the division or resection of the common or hepatic duct. The author reports a case in which 2 cm. of the hepatic duct was resected during a cholecystectomy performed under

the most favorable circumstances. Fortunately the accident was recognized at the time and an anastomosis was made over a T-tube. The T-tube was removed in three weeks. A perfect functional result has lasted more than five years. The anastomosis can be made over a straight tube or, when the duct is large, without a tube. The point emphasized is the importance of realizing that an injury has occurred and repairing the damage immediately.

In some cases reconstruction of the damaged bile tract can be accomplished by one of the many methods which have been described. On the other hand, the damage may be so great or of such a character as to necessitate the implantation of the hepatic duct into the duodenum. This operation has given the best results even in the most hazardous cases.

The technique of gastroduodenostomy is described as follows:

The cut hepatic duct and duodenum are located by the most careful dissection in the mass of adhesions which have developed around the stump of the hepatic duct. Operators are warned against the danger of opening the portal vein. It is advisable, before any doubtful channel is opened, to use a fine aspirating needle with a glass-barrel syringe.

A slightly curved flap is dissected out of the entire thickness of the duodenal wall over an area which will leave an opening into the duodenum about 2 cm. in diameter. The duodenal flap is then approximated to the posterior and lateral aspects of the stump of the hepatic duct in such a manner as to permit a mucomucous union of the posterior half of the circumference of the duct. The remaining free margins of the opening in the duodenum are sutured to the capsule of the liver just above the end of the hepatic duct by continuous catgut sutures so that the opening in the duodenum not occupied by the end of the hepatic duct is effectually closed. The omentum is used to surround the anastomosed area. Two small strips of rubber tissue may be introduced.

Attention is called to the necessity for a large opening in the duodenum. The procedure described, with a mucomucous union for two-thirds or at least one-half the circumference of the stump of the hepatic duct and the suturing of the opening in the duodenum to the liver, allows for contraction and obviates the danger of secondary stricture.

F. R. SANDERSON.

Deaver, J. B.: Pancreatitis. *Surg. Clin. N. Am.*, 1921, i, 1.

The pancreas generally becomes involved through some peripancreatic disturbance.

The embryology, gross and microscopic anatomy, relations to other structures, blood supply, lymphatics, physiology, and nerve supply of the pancreas are described in detail.

The abundant arterial supply (five sources) protects this organ against gangrene from occlusion. The rich lymphatic system and free communication

of lymph vessels is of importance in giving rise to the condition known as pancreatic lymphangitis.

It is the pancreatic ferments which are active factors in producing certain diseases of the pancreas, particularly fat and hæmorrhagic necrosis. The tests for these ferments, both indirect and direct, are given in the article.

The theories of the pathogenesis of pancreatic disease ascribing the condition to injury to the pancreatic tissues and activation of the pancreatic juice within the gland are applicable to certain cases. There is a large class of cases, however, in which an infective process seems to play the chief part. This has been borne out by the observation made at the operating table that most cases of chronic and subacute pancreatitis are associated with infections of the biliary tract and not a few with peptic ulcer or some other lesion of the gastro-intestinal tract which produces a retroperitoneal inflammation. The problem in these cases, therefore, is reduced to the discovery of the route of the infection.

Deaver and Pfeiffer claim this infection occurs by way of the lymphatics, the sequence of conditions being cholecystitis, lymphangitis, lymphadenitis in the gastrohepatic omentum along the course of the cystic duct and the common duct, peripancreatic lymphadenitis, and pancreatic lymphangitis. Therefore the rational therapy is treatment of the primary focus of infection.

The toxæmia of acute pancreatitis is assumed to be due to the toxic derivatives of the action of trypsin on protein material.

Acute pancreatitis is not limited to the conditions associated with fat necrosis and hæmorrhage but may occur as a simple non-suppurative inflammation characterized by swelling, œdema, and possibly tenderness at the site of the pancreas.

The possibility of a hæmatogenous infection has been demonstrated. Deaver has seen three cases of primary suppurative pancreatitis, one at operation and two at postmortem examination.

Hæmorrhagic pancreatitis has been artificially produced in various ways. In very severe cases serosanguineous exudate (the typical beef-broth fluid of pancreatitis) is usually found in the peritoneal cavity. Closely allied to this type is gangrenous pancreatitis. The combination of the initial trauma and ferment activity leads to the death and sloughing of a more or less extensive amount of tissue. The prognosis depends on the extent of the process. A natural sequence of gangrene is suppuration of the pancreas, that is, secondary suppurative pancreatitis as distinguished from primary abscess within the gland. General peritonitis may result, but the pus tends to localize.

Of all acute abdominal seizures, pancreatitis probably is the most agonizing and at the same time is probably more rarely diagnosed before operation than any of the other acute abdominal conditions. The difficulties of diagnosis are due to its comparative infrequency, the absence of a definite pathognomonic sign or symptom, its frequent

association with other abdominal lesions, and the patient's desperate condition which, particularly in the ultra-acute case, makes operation imperative without the formality of a diagnosis.

Deaver deals with the various symptoms and diagnostic points in detail. The symptoms which distinguish pancreatitis from other conditions may be briefly summarized as sudden, overwhelming pain in an apparently healthy and usually an obese person, incessant vomiting, subnormal temperature, weak pulse, upper abdominal distention, transverse resistance not easily elicited, collapse, a peculiar cyanosis, and a tumor in the epigastric region or a mass in the loin.

Recovery from acute pancreatitis without operation is not unknown but the prognosis is much better with operation. Instant drainage of the pancreas is the procedure indicated. Resection of the pancreas is not as yet a practical measure.

In a series of 18 cases of acute pancreatitis, gallstones were found in 15. In 11 cases the gall-bladder was drained (with 3 deaths) and in 2 the gall-bladder and one common bile-duct were drained, both patients recovering. In 4, the operation was limited to the pancreas, the bile passages being untouched; 3 of these patients recovered and 1 died. One patient died on the operating table before any operation could be undertaken. Other associated conditions, such as duodenal ulcer or duodenitis, are not considered in the article. The essential factor in the treatment is the drainage of the toxins away from the pancreas. Pancreatotomy is beneficial also because it relieves the tension.

The approach to the organ may be either transperitoneal or extraperitoneal through a loin incision. The former is the method of choice in beginning pancreatitis and when the diagnosis is doubtful.

Too large an incision in the pancreas presents the risk of hemorrhage difficult to control. Scarification of the peritoneum over the gland should be sufficient to permit the contact of gauze drainage with the surface. A few blunt punctures of the pancreas may be of value in opening up the ducts and providing an outlet for the secretion. Free drainage should be instituted by means of gauze and tubes. Both of these should be surrounded by a sheet of rubber dam to reduce the chance of the formations of adhesions to the stomach and intestines and to render the subsequent removal of the gauze less painful. Free fluid in the peritoneal cavity must be removed as far as possible by gentle wiping and by means of a glass tube inserted in the pelvis through a stab wound above the pubis.

The gauze drainage should be left in until it comes away almost of itself. Too early removal may cause bleeding, thrombosis, and spreading infection.

One of the most troublesome postoperative effects of drainage in acute pancreatitis is the formation of sinuses. The skin must be protected from the ferments by means of a bland ointment. A strict anti-diabetic diet is advisable and has been found useful in promoting healing.

Chronic pancreatitis has the same lack of a definite syndrome and entirely reliable clinical tests as acute pancreatitis. It is generally considered as having two chief forms. One form involves the interlobular septa and the parenchyma of external secretion while the other attacks mainly the islands of Langerhans and to a degree the secretory tubules and interlobular structures. The latter is the type associated with defective carbohydrate metabolism which in pronounced cases develops into diabetes. Interlobular pancreatitis, on the other hand, is characterized by digestive disturbances.

The rôle of disease of the lymphatics about the pancreas as the first stage of pancreatitis has led to the following classification of chronic pancreatitis: chronic lymphangitic pancreatitis; chronic interlobular pancreatitis; and chronic interacinar pancreatitis. The last two are the end-results of a pancreatitis.

Infection by way of the lymphatics plays the most prominent part in the etiology of pancreatitis. Other causes lie in the blood-stream, the ducts, direct contiguity, and trauma.

If the infection were carried by way of the duct system a diffuse pancreatitis affecting the entire gland might be expected, but at operation it is found that in most instances chronic pancreatitis is most frequently associated with inflammation of some other abdominal viscus and that the diseased part of the gland, the head, is the part which has a free lymphatic relationship with the affected viscus. The part of the head of the pancreas most often diseased is the area between the ducts of Wirsung and of Santorini.

Obstruction plays a very minor rôle in the more common chronic pancreatitis seen at operation.

Chronic pancreatitis is more common in the male sex (58 per cent in Deaver's cases). Most of those so affected are in the third, fourth, or fifth decade of life.

The symptoms of chronic pancreatitis in order of frequency as found in 30 cases at the Lankenau Hospital of Philadelphia were recurrent attacks of acute severe pain in the epigastrium and the left costal margin, jaundice, flatulency, vomiting, a history of indigestion, colicky pain, and indigestion between attacks. Gastric analysis showed subnormal acidity in about 84 per cent of the cases in which the analysis was made. Glycosuria was present in about 7 per cent.

The diagnosis of chronic pancreatitis rests mainly on the history and the physical and clinical signs. In the majority of cases exploration alone will decide.

At operation it is difficult to distinguish between an advanced induration pancreatitis and malignancy of the head of the pancreas. Deaver states that the differentiation is rarely, if ever, possible. In doubtful cases the patient should be given the benefit of the doubt by draining the bile externally or into the duodenum, stomach, or intestines.

Preventive treatment is of importance. Once the diagnosis is made, delaying operation is dangerous

in view of the irremediable changes which may take place.

No promising method of attacking the organ directly having been devised as yet, the surgical treatment of chronic pancreatitis becomes a question of the best treatment of the pathology of the biliary tract encountered at operation.

Prolonged drainage for the cure of pancreatitis acts in two ways. By removing infection it gives the pancreas a chance to throw off inflammation, and by relieving the pressure within the ducts it gives it a chance to recover. Drainage is obtained externally by draining the biliary tract, and internally by cholecystenterostomy or choledochoduodenostomy.

Peptic ulcer if present should also be treated, preferably by excision.

The possibility of operating upon the pancreas directly has been demonstrated experimentally but as yet it is of academic interest rather than of clinical value.

The practical value of a limited study of this kind consists in its emphasis on the importance of the pancreas as a digestive organ and the necessity of considering it in the diagnosis and treatment of upper abdominal disease. It calls attention also to the etiological relationship between disease of adjacent viscera and pancreatitis and the possibility of preventing the development of pancreatitis by early attention to these conditions.

Five case histories are given. C. R. STEINKE.

Stuart, M. C.: Injuries of the Pancreas, with a Report of a Single Case of Subcutaneous Injury. *Northwest Med.*, 1921, xxi, 58.

A brief review of the literature on injuries to the pancreas is given with a bibliography and a few notes regarding the cases, including the cause, the treatment, and the result.

Stuart's case was that of a woman 41 years of age whose epigastrium was pressed sharply against an automobile steering-wheel. Dyspnoea, vomiting, and severe abdominal pain were the chief symptoms. No marked rigidity and no other evidence of injury to the parietes was noted. There was not much alteration in the temperature, pulse, or respiration.

Exploratory operation was performed twenty-three hours after the injury. The omentum, mesentery, and parietal peritoneum showed a number of disseminated characteristic sulphur-yellow spots of fat necrosis. When an opening was made through the gastrohepatic ligament about 8 oz. of a brownish blood-tinged fluid were found and sponged out. The entire pancreas was swollen, congested, and soft. The peritoneum covering the body of the pancreas was abraded at several points and the brownish serosanguinous fluid appeared to come from this region. No evidence of injury to other viscera was found.

Two cigarette drains were placed in contact with the body of the pancreas and one in contact with its head and brought out of the abdomen through a stab wound in the right flank. The median in-

cision was closed in the usual manner. The patient was discharged from the hospital thirty-five days after the injury as cured. Two and one-half years later she was in perfect health. C. R. STEINKE.

MISCELLANEOUS

Rabinowitch, I. M.: The Prognostic Value of the Study of the Blood Chemistry in the Acute Abdomen; Preliminary Report. *Canadian M. Ass. J.*, 1921, xi, 163.

Conclusions drawn from a small number of cases are as follows:

1. In intestinal obstruction, whether mechanical or adynamic, in acute general peritonitis, and in acute pancreatitis, the blood-urea nitrogen rises above the normal in spite of normal kidney function.

2. This rise in the blood urea is therefore due to increased tissue destruction and is not the result of defective kidney elimination.

3. The tissue destruction is due probably to the toxic effect of a proteose absorbed.

4. The maintenance of a high blood-urea nitrogen in the presence of good kidney function is indicative of an unfavorable prognosis in spite of the amelioration of the clinical symptoms.

I. W. BACH.

Fagge, C. H.: Subphrenic Abscess. *Lancet*, 1921, cc, 571.

Subphrenic abscess is now believed to be due to gastric or duodenal ulceration in 80 per cent of the cases. Previous to the last decade the appendix was held responsible in 50 per cent. The change in the theories as to the cause is due to the early recognition of, and operation for, appendicitis. Practically all subphrenic abscesses are intraperitoneal if we exclude a few due to gunshot wounds in the retro-peritoneal tissues or to extensions from the liver or other abscesses through the non-peritoneal surface.

Two types of subphrenic abscess are recognized. In one the onset may be acute, the result of the subacute or chronic perforation of a hollow viscus. Because of the previous localized peritonitis and adhesions, the neighborhood of the base of the ulcer is walled off. Either by perforation or extension of infection through the wall of the viscus an abscess forms, which at first is limited to adjacent organs. As it enlarges it points on the abdominal wall.

The second type of subphrenic abscess is found as a complication following operation usually for an upper abdominal lesion. These are more insidious in onset and difficult to diagnose.

An important factor in the diagnosis is the history, especially a history of ulcer symptoms and intra-abdominal infection. The initial symptom is pain which is usually localized to the spot where pus is found later. Vomiting and, more often, hiccough occur. Among the general symptoms are septic temperature, rapid pulse, a dirty dry tongue, increasing anæmia, leucocytosis, and a muddy complexion.

The local signs of subphrenic abscess consist of local rigidity and deep tenderness followed by dullness and swelling. If colon bacilli are present, gas may cause a tympanitic note or a peritoneal friction sound. Because of adhesions the liver dullness may not extend downward and the tumor may not be movable with respiration. The X-ray will show the diaphragm high and immobile on the affected side.

Examination of the chest will reveal compression of the base of the lung on the affected side and later perhaps signs suggesting pleural effusion. The latter is a complication in two-thirds of the cases.

Spontaneous rupture of the abscess may occur but should be prevented by operation. Under a general anæsthetic an exploring needle should be used to locate the abscess definitely. The spread of the infection to the pleural or peritoneal cavity has not been noted.

The posterior transpleural thoracic route is the route of choice for operation. A 3-in. section of the rib over the lowest point of the abscess as ascertained by the needle is removed. The diaphragm is incised but not perforated, and the upper edge is sutured through the parietal pleura and intercostal space to the upper margin of the wound. The abscess is then incised freely and a large rubber tube is inserted.

In conclusion the statement is made that subphrenic abscess may not be definitely diagnosed until pus is found and drained and even then it may be difficult to determine that one is not within the liver and draining an amœbic abscess, an abscess of suppurative pylephlebitis, or even a suppurating hydatid cyst as the three syndromes are similar. Pylephlebitis is differentiated, however, by its greater severity, rigors, and jaundice, and a hydatid cyst by the fluid aspirated. MERLE R. HOON.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Meyerding, H. W.: Congenital Torticollis. *J. Orthop. Surg.*, 1921, n.s. iii, 91.

The author believes congenital torticollis to be rarely met with in the general practice of medicine and surgery. From January, 1910, to October, 1919, over 212,000 patients were examined at the Mayo Clinic, yet only 26 with congenital torticollis were examined and operated on. The average age of these 26 patients was 17 years. Twenty-three had had no previous treatment.

The etiological factors appear to be trauma to the sternocleidomastoid muscle at, or preceding, birth, which produces ischæmia and results in chronic interstitial myositis. The ischæmia may result from pressure to the sternomastoid branch of the superior thyroid artery or from a hæmatoma into or around the sheath of the muscle affected. Eight of the patients whose cases are reviewed had been traumatized at birth, 5 by the use of forceps or an unusually long and difficult labor, 2 in breech presentation, and 1 in transverse presentation. One ascribed the condition to injury soon after birth. Seventeen gave no definite cause for the condition or history of trauma. Since the ages of the patients varied from 4 months to 28 years details with regard to injuries at birth in some of the cases were extremely difficult to obtain.

The diagnosis presented little difficulty. There was a painless contraction of the sternocleidomastoid muscle which was easily palpated and not tender and produced the characteristic deformity in which the mastoid is drawn toward the raised and narrowed shoulder on the side affected and the chin is forced in the opposite direction.

Pott's disease, myositis, perispondylitis, spasmodic torticollis, fracture of the spine, and syphilis are differentiated. Meyerding believes the treatment of

congenital torticollis is surgical although some of the earlier cases may be benefited by manipulation. Surgical treatment offers a rapid, safe, and certain method of relief with a minimum of pain and discomfort, and is used in practically all the author's cases. When scoliosis is present the spinal deformity is first corrected and a body cast then applied. Thus when the operation is performed and the contracted sternocleidomastoid muscles are divided, the head may be easily controlled and held in over-correction by means of a cast to the head and neck connected with the body.

The technique of the operation is discussed and the end-results are reported; 18 of the 26 patients operated on were traced, 14 were reported cured, and 4 much improved. Attention is called to the fact that the lack of early treatment leads to deformity which even the reposition of the head in normal balance and poise cannot overcome, especially if the patient's full growth has been attained. It is well to have the patient understand this and also that if he has any facial deformity, it will be accentuated, at least for a time, and if he is an adult it will probably be permanent. In children with distortion excellent facial recoveries are obtained.

The technique of the operation is described and illustrated.

Glass, E.: An Unusual Multilocular Cyst of the Forearm (*Seltene multilokuläre Cyste der Haut am Unterarm*). *Zentralbl. f. Chir.*, 1921, xlviii, 80.

A man of 64 had a tumor the size of an egg on the extensor side of the middle third of the right forearm. This growth lay just beneath the skin and was adherent to it, but was movable on the fascia. It had been growing gradually for fifteen years. It was found to be a cyst made up of several large compartments filled with tough mucus but without dermoid contents or hair. Its thick capsule was lined with a fine, delicate, flat, simple epithelium

which in only one place passed into a stratified pavement epithelium.

As this tumor was not a bursa, a lymph cyst, a cystically degenerated skin tumor, or a parasitic cyst, it must be considered a "choristoma." Although it had no dermoid contents or skin appendages the varieties of growths which arise from developmental anomalies are so numerous the author feels warranted in classifying it as a dermoid cyst because of the presence of stratified pavement epithelium.

VON TAPPEINER (Z).

Romich, S.: Static and Dynamic Deformities of the Legs (Ueber statische und dynamische Beindeformitaeten). *Ztschr. f. orthop. Chir.*, 1920, xl, 230.

The acquired deformities of the lower extremity may be divided into two groups: (1) static, those arising from the burden of the weight of the body, such as coxa vara, genu valgum, and pes valgus, and (2) dynamic, those due to muscle traction during movement, such as coxa valga, genu varum, and pes varus. In the static deformities the skeleton tends to become adapted to increased static demands; pes valgus and genu valgum are types of adaptation in the function of standing. Pes varus, on the contrary, is an adaptation to the rapid development of the foot, while varus deformity of the whole leg is an increase in the capacity to bear burdens during motion.

In pronounced deformities the boundaries within which the adaptation can be utilized are overstepped. Coxa vara and valga are compensatory processes. A decrease in the angle of the neck of the femur counteracts genu valgum; it is not demanded by static requirements. In coxa valga, genu varum, and pes varus the conditions are reversed. In the normal femur the angle of the neck is midway between the static extreme of coxa valga and the kinetic extreme of coxa vara. Analogous compensatory processes are shown in flat-foot and knock-knee. Flat-foot, when it is not carrying weight as in walking, is brought into the opposite position so long as it is not fixed. A corresponding change is observed in knock-knee.

KOENIG (Z).

FRACTURES AND DISLOCATIONS

Collins, A. W.: Fracture Reduction and Fixation with a Specially Designed Band. *Arch. Surg.*, 1921, ii, 354.

The band described is made of silver or of nickel or copper heavily plated with silver. It is very thin, being of 26 standard gauge. The two cross-bars are twice this thickness.

The small end of the band is bent and passed around the bone, beginning underneath, and then passed through the window in the band and into the instrument. Tightening the band forces the fragment into position. Extension and manipulation of the limb may be accomplished at this time if necessary. When drawn as tight as possible, the

band is locked by pushing on the instrument which bends it on itself, and the screw tightening the band is loosened. A little lateral motion back and forth will then push the instrument away from the band so that it may be cut with a pair of heavy scissors. The end should be bent over.

The conclusions drawn from its use in more than 100 cases of fracture are as follows:

1. The band is more quickly applied than screw plates, bone grafts, kangaroo tendons, medullary dowels, etc.
2. It furnishes sufficient force under easy control to bring the parts into apposition and is sufficiently strong to immobilize them.
3. It provides a simple means of fastening without disturbing the tension or position of the band or the fragments.
4. It adapts itself to an uneven flaring surface and through its use a circle of unyielding pressure at any one point is avoided.
5. Its use is compatible with good callus formation.
6. It has no deleterious effect on growing bone; on the contrary, it stimulates growing bone.

I. W. BACH.

Luccarelli, V.: Trans-Cutaneous Cranial Decompression in Fractures (Decompressione cranica transcutanea nei fratturati). *Arch. ital. de chir.*, 1921, iii, 165.

In the case of a soldier with a closed cranial fracture the author regarded the condition as favorable for an attempt at decompression by subjecting the scalp to direct traction. He was convinced that the symptoms in this case were due to depression of the bony table alone and that there were no associated lesions of the brain.

After the area had been shaved and treated with benzine and iodine heavy silk threads were passed by means of a curved needle in the zone of depression so that they were equidistant from each other and were parallel to the long axis of the body. Care was taken that a good tract of the periosteum was included in the sutures. Rolled compresses and gauze strips were then arranged so that independent conical traction could be exerted on the threads without interfering with their movement in pulling the depressed fragments up. The author describes and illustrates a horseshoe-shaped hinged wooden apparatus and bar of wood used in obtaining traction on the threads.

The day after the application of traction the paralysis on the right side disappeared and there was some recovery of speech and consciousness. Urinary incontinence persisted, but recovery from all symptoms was subsequently rapid. The conical elevation produced by the traction on the threads was relaxed by degrees. The patient was discharged thirty days after his injury and was then in excellent condition.

The method of exerting traction by means of sutures in the scalp and periosteum should be

reserved for cases of closed cranial fracture in which the bony fragments are mobile and it is clear that the clinical phenomena are not due to brain lesions. In such cases it constitutes a very rapid method of effecting decompression without the addition of operative trauma to the injury already present. Moreover, it does not interfere with a subsequent craniotomy or other operation if such is found necessary.

W. A. BRENNAN.

Golden, W. W.: Dislocation of the Semilunar Bone: Report of Case in Which Reduction Was Successful. *J. Am. M. Ass.*, 1921, lxxvi, 446.

The case reported was that of a man, aged 37, who was thrown out of an automobile. At the time of the examination a few hours later he was suffering agonizing pain in the entire left upper extremity. This was most intense in the region of the left shoulder and at the wrist. Physical and X-ray examination of the shoulder proved the absence of any injury in that region. The wrist was swollen and exquisitely tender, and presented a small swelling on its anterior aspect. A roentgenogram revealed complete dislocation of the semilunar bone to the anterior aspect of the lower end of the radius. In this change of position it had been twisted about 225 degrees, the anterior end acting as the fulcrum.

The first attempt at reduction brought the bone nearly into its normal position as far as its relation to the radius was concerned, but failed to re-establish its normal relation to the os magnum. To accomplish this a second attempt was necessary. A roentgenogram taken nine months after the accident disclosed virtually complete restoration of the normal relations of the carpal bones to one another and to the radius. Immediately after the reduction the severe pain in the upper extremity was entirely relieved. Some soreness at the wrist persisted for a while and for a longer time there was slight numbness of the fingers supplied by the median nerve. It is evident that the bone in its false position damaged the median nerve by stretching it. The nerve symptoms gradually disappeared. The function of the wrist improved continuously under heat and passive motion. Ten months after the injury function was normal.

MARGARET I. MALONEY.

Lorenz, A.: So-Called Congenital Dislocation of the Hip; Its Pathology and Treatment (Die sogenannte angeborene Huftverrenkung, ihre Pathologie und Therapie). Stuttgart: Enke, 1920.

Lorenz believes that dislocation of the hip, aside from teratological malformations, is not congenital as a rule, but is an acquired static deformity which was one of the earliest results of man's having acquired an upright position burdening the hip with the weight of the body.

This book is divided into twenty-two chapters. In the chapter on the history of congenital disloca-

tion of the hip the discussion of Koenig's opposition to the very conservative treatment recommended about 1865 is of interest. The reason why the older operators failed was because they selected their cases poorly.

With regard to the etiology Lorenz states that the condition is not congenital but is acquired during the first two or three years of life and brought about first by muscle traction and then by the weight of the body which cause the head of the femur to slide gradually up out of the too shallow acetabulum. It is therefore a static deformity due to a congenital predisposition. The predisposition is the result of a delay in the growth of the bone, but the cause of the delay in growth is unknown. The congenital predisposition to dislocation of the hip is therefore to be regarded as a consequence of disturbances in the innervation concerned with the growth of the skeleton of the pelvis and the lower extremity.

The female sex is affected six times as often as the male, and unilateral luxation is almost twice as frequent as bilateral. Cases of congenital dislocation of the hip are four times as frequent as cases of congenital club-foot and twelve times as frequent as cases of congenital wry-neck.

Reposition with maximum horizontal abduction gives the best results. There should be fixation for a period of six to nine months; it is only in exceptional cases that a second bandage is necessary. Operation should be performed by the end of the sixth year in cases of unilateral luxation and by the end of the fifth year when the condition is bilateral. Treatment should be begun when the dislocation first manifests itself by difficulty in walking.

The book contains a bibliography of thirty pages and is indispensable for anyone interested in the subject.

B. VALENTIN (Z).

Gordin, A. E.: A Plaster Rope Cast: An Efficient Splint for Infected Fractures of the Leg. *Surg., Gynec. & Obst.*, 1921, xxxii, 276.

Gordin has devised a plaster rope cast which he has used successfully in cases of osteomyelitis and compound infected fractures of the leg in which both immobility and drainage were necessary. This cast is made of 6-in. plaster bandages. A bandage is folded upon itself several times and then folded lengthwise three times so as to make a flattened rope between ten and fifteen layers thick and strong enough to stand considerable strain.

Usually one rope is molded to the anterior surface of leg and one to the posterior surface, and at various intervals where there are no raw surfaces or discharging wounds, several ropes are wound around the leg. Usually about four ropes around the leg will hold it very firmly.

An ordinary plaster cast is not efficient in such cases for even when an opening is cut the discharge runs behind the plaster, macerating the skin and softening the plaster. By using the rope cast the author has been able to keep the leg very dry and clean. Easy access to the wound is afforded and

the leg is kept well immobilized. The cast is recommended especially for use on children.

G. W. HOCHREIN.

Basset, A.: Bone Pegging Without Arthrotomy in Fractures of the Neck of the Femur—Delbet's Method (*L'enchevilement sans arthrotomie des fractures du col du fémur—méthode du professeur Pierre Delbet*). *J. de chir.*, 1921, xvii, 81.

In fractures of the neck of the femur Delbet has employed fibular grafts, etc., but since July, 1919, he has used pegs or screws of dead animal bone. These screws are better adapted to the bone tunnel in which they are placed than an irregular flat bone graft. In recent fractures they are as easily inserted as metallic screws and as they are well tolerated they do not, like metallic screws, act as foreign bodies. In pseudarthrosis they combine the advantages of a screw and a bone graft and are more favorable than metallic screws for the formation of secondary callus. Delbet states, however, that while it is evident that screws of dead bone do not act the same as fibular grafts, he is as yet unable to draw definite conclusions as to their relative merits in pseudarthrosis as his oldest case in which the screws were used dates back only thirteen months. Pegs and screws of dead bone become rapidly absorbed. In one of Delbet's cases this resorption could be perceived by the X-ray at the end of thirty-eight days. It occurs only in the intraosseous portion of the screw; the portion not surrounded by bone remains intact.

In Delbet's opinion an arthrotomy is not necessary; the opening of the joint is a dangerous and useless procedure. His method therefore consists of uncovering the external surface of the femoral diaphysis at its union with the great trochanter by a simple incision without opening the joint, and then introducing a bone peg or screw through the mass of the trochanter and neck as far as the center of the head of the femur. The peg or screw should penetrate the upper part of the external surface of the diaphysis and should be embedded in the center of the head to find solid support. These two zones remain intact even in old cases of pseudarthrosis, and in the aged they are not attacked by bone rarefaction.

The point of penetration of the screw is situated $1\frac{1}{2}$ cm. beneath the subtrochanteric crest and is in the axis of the neck of the femur, but Delbet has found both experimentally and clinically that it is not easy to drive a screw from this point correctly so as to reach the center of the head of the femur. Study of this matter resulted in the invention of a specially constructed guiding instrument which is described by Basset. The use of this instrument permits a bone drill and screw to traverse the trochanter and neck and arrive at the center of the femoral head. The details of technique and instrumentation are described. They include a pre-operative X-ray examination which enables the surgeon to determine: (1) the weight which must

be attached to the fractured limb to obtain the maximum reduction of shortening; (2) the best position to give the limb in relation to the median axis of the body in order to re-establish as much as possible the normal angle of inclination of the femoral neck; and (3) the length of the peg or screw to be employed.

The pre-operative procedures are the same whether a bone auto-graft, a dead bone peg or screw, or a metallic screw is used for the osteosynthesis.

Basset has collected the reports of 95 operations for recent fracture of the femoral neck or pseudarthrosis done according to the technique and instrumentation employed by Delbet. There were 6 failures. In these 6 cases the course of the bone screw or graft was incorrect. The 95 cases include all kinds of fractures with little or much displacement, and 31 pseudarthroses, the majority of which were associated with considerable ascent of the external fragment and more or less complete resorption of the stump of the neck.

The dead bone screw is prepared from beef bone and is about 12 mm. thick. Basset believes it would be hazardous to endeavor to place a graft or screw of this size without the use of a guiding apparatus and a pre-operative X-ray examination.

In cases of recent fractures of the neck of the femur Basset prefers the use of the metallic screw as the strength of a screw of dead bone is not sufficient to support the weight of the body.

The histories of 10 cases operated upon by Basset are given. W. A. BRENNAN.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Carr, W. P.: The End-Results of Operations for Bony Ankylosis of the Jaw. *Ann. Surg.*, 1921, lxxiii, 314.

In this article Carr reports 6 cases of ankylosis of the jaw, 3 operated upon prior to 1916 and 3 since then. He uses the instruments and methods devised by J. B. Murphy. In discussing certain accidents which are apt to occur and methods by which they may be avoided he calls attention to the following facts:

The temporal artery can be felt and located and the vertical incision made just anterior to it.

The horizontal arm of the incision may be made along the lower border of the zygoma instead of the upper border, as recommended by Murphy. It will then still be above and parallel to the main temporofacial branches of the seventh nerve and may be carried down to the bone with one sweep of the knife. No important structure will be cut.

For purposes of orientation a careful dissection should be made at the anterior end of the horizontal limb of the incision and the wound drawn down until the anterior border of the ramus can be felt and freed sufficiently to permit the insertion of a Murphy retractor beneath it.

In all the author's cases the parotid gland projected over the ramus almost, or quite, to its midline, and could hardly be distinguished from the fat and connective tissue lying in that region. In his first four operations Carr injured or cut into it three times so that a salivary fistula resulted. Although these fistulae healed spontaneously in from three to eight weeks, they were very annoying for a time and necessitated frequent redressings. This accident may be avoided almost certainly if the operation is begun as recommended and the subsequent dissection is made by lifting up all tissue over the bone *en masse*, keeping close against the periosteum until the posterior border of the ramus is reached, the only incision through these tissues being a deepening of the original skin incision over the lower border of the zygoma and well above any important structure. The second Murphy retractor may then be inserted under the posterior edge of the ramus until it meets the first one behind the center of the bone.

The bone will then be completely isolated in the region to be divided by boring a chain of $\frac{5}{8}$ -in. holes through it with a cranial drill, connecting them with a gouge chisel, cutting away the bone, and leaving a rounded point for articulation.

The bone should be gouged out without hammering. This can be done easily if the holes are bored close together.

In most cases in which the affection is unilateral the mouth will open readily after division of the bone, even when the condition is of long standing. In some cases, however, particularly when both sides have been affected, the masseter, pterygoids, and other muscles have become so contracted that the teeth cannot be separated more than $\frac{1}{2}$ or $\frac{3}{4}$ in., even with considerable force. Great care must be taken in prying the mouth open in such cases as the teeth, probably from long disuse, have a very slight hold in the jaw and are very easily shelled out.

Carr does not favor the interposition of any extraneous substance between the divided bones. He does not believe this is necessary if a rather wide section of bone ($\frac{5}{8}$ in.) is removed and the articular end is shaped to a rounded point. The greatest danger of recurrence would seem to be the formation of callus attaching the anterior border of the ramus to the zygoma. This, he believes, is prevented by cutting out more bone anteriorly.

The results in the author's first three cases after a period of four to six years are all that could be desired. At the time this article was written the patients were able to separate the front teeth an inch or more and to eat without difficulty. In the last three cases also the results to date have been satisfactory.

The article is concluded with a brief history of each of the six cases. G. W. HOCHREIN.

Chubb, G.: A Further Series of 40 Cases of Bone-Grafted Mandibles. *Lancet*, 1921, cc, 640.

The 40 cases of bone-grafted mandibles reported in this article with 60 cases which were reported in a

previous article bring the total up to 100. In the first 60 cases bony union was obtained in 93 per cent, while in the group of 40, bony union resulted in 24, the treatment was a failure in 4, and the remainder were operated upon only recently.

The operative technique consisted in taking a graft from the crest of the ilium, fitting it, and securely wiring it in end-to-end apposition to the jaw fragments by means of "templates" which are described. In almost every case the whole depth of the jaw was utilized in the formation of the facet for apposition with the graft. The upper or alveolar border of the graft was at first formed by the open cancellous tissue of the iliac crest and X-ray examination has shown that it became rounded off with a layer of compact bone which was capable of bearing the direct pressure of a denture within a few months after the operation.

The splints were opened and the free use of the mandible allowed at the second or third week. Radiograms showed distinct evidence of union across the line of junction at the third or fourth week and no trace of the line of union by the third or fourth month. This rapidity of union was independent of the size of the graft. Cases with extensive loss of bone showed clinical union with no trace of spring by the fourth week. Opportunities occurred for examination of the nature of the union obtained in 3 cases six, fifteen, and eighteen months respectively after the bone-grafting operation. Sections made from these specimens were stained with mallory. The periosteum on the surface was deeply stained, while the zone of union remained unstained. Under the high power of the microscope this region was seen to consist of dense bone, the lamellae and lucanae of which were distinctly visible.

Co-operation between operating and dental surgeons has contributed largely to modern reconstructural oral surgery. FRENCH K. HANSEL.

Taylor, R. T.: Reconstruction of the Hand: A New Technique in Tenoplasty. *Surg., Gynec. & Obst.*, 1921, xxxii, 237.

In the reconstruction of the hand chief attention should be paid to the restoration of function in the tendons.

The operation should be, of course, bloodless. A crescentic or semicircular flap should be dissected back at the beginning of the operation so that the point of tendinous union will not lie under the line of suture of the skin where it might be caught in the skin scar. The tendons in question should be kept moist as far as possible by means of normal salt solution.

The author has devised a clamp for holding the tendons while the sutures are being inserted. With this new instrument it has been found possible to work out a new technique whereby the fine silk approximation of stay sutures may be put in more perfectly, a minimum of silk being left exposed.

This method consists of threading a fine straight cambric needle on each end of fine intestinal silk

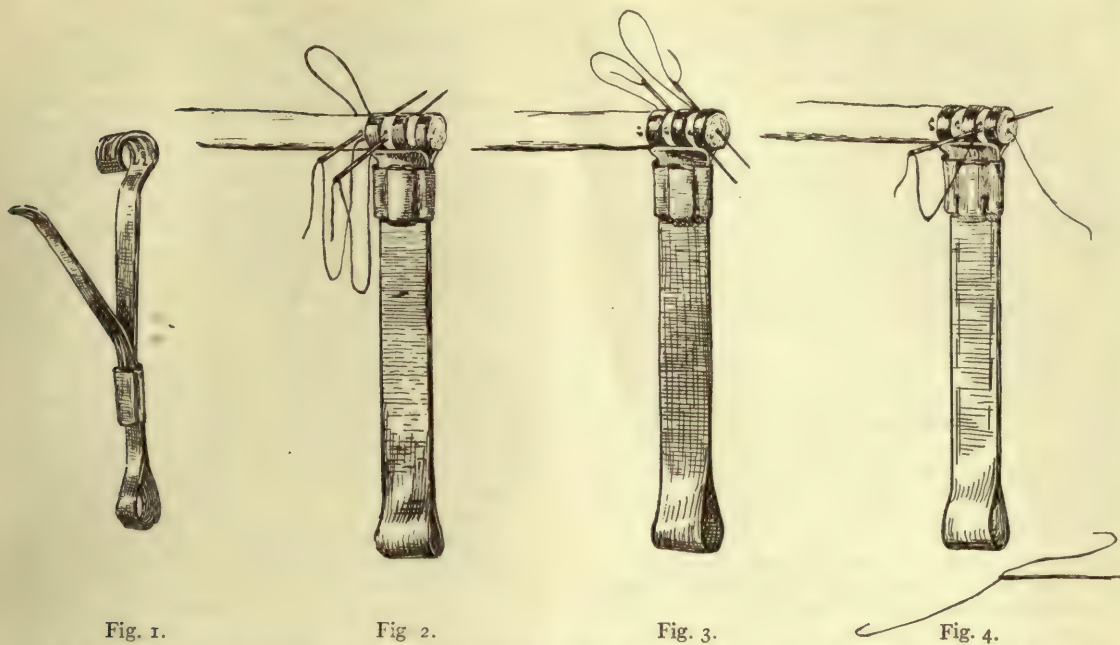


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 1. The author's accepted type of clamp made of clock spring. Fig. 2. Silk threaded in two needles showing transfixation of tendon to left of clamp. After thread is passed obliquely on its return from far side back to near side in first fenestrum, it is passed obliquely to far side in second fenestrum (the author's technique). Fig. 3. Needle passing from far side of second fenestrum to end of tendon. Fig. 4. Second needle passing from near side of second fenestrum through end of tendon.

of suitable length. With the tendon clamp applied as close to the end of the cleanly severed end of the tendon as possible, the first needle transfixes the tendon just beyond the clamp straight through and immediately transfixes the tendon obliquely, coming out of the first fenestrum on the near side. Next, it immediately transfixes the tendon obliquely, coming out of the second fenestrum of the far side, and finally transfixes the tendon obliquely, coming out at the free end of the tendon. The first needle is then removed. With the second needle, the same procedure is carried out again, only in the reverse direction, coming out obliquely in the first fenestrum on the far side, then the second on the near side, and finally the opposite side of the free end of the tendon.

Thus it will be seen that none of the silk except small dots remains exposed on the side of the tendon. When a similar arrangement of sutures is placed in the other tendon, the four silk strands may be tied closely, approximating the severed ends end-to-end by double surgeon's knots, and the excess of silk may be cut away. In this manner the knots are entirely buried between the cut ends of the tendons.

Small sheets of fascia and fat should be dissected from the adjacent subcutaneous tissues and wrapped around the point of union in order to prevent further adhesion as far as possible.

Many of the cases show marked stiffness after anatomical or functional restoration and require more or less prolonged after-care and attention to secure the maximum efficiency obtainable. Hydrotherapy in the form of the warm or hot whirlpool is an excellent preparation for manipulative treatment with progressively increasing passive, active, and resistant movements either in or out of the water, and later massage and Bristow surging faradism.

Much stiffness is often found in old traumatic and paralytic hands with wrist-drop and flexed fingers. Such cases showing marked tightening up of the ligaments at the metacarpophalangeal joints may be treated by continuous stretching, and recontracture may be prevented by the use of suitable splints. The author considers the Skirball and Lewis splints of greatest value. I. W. BACH.

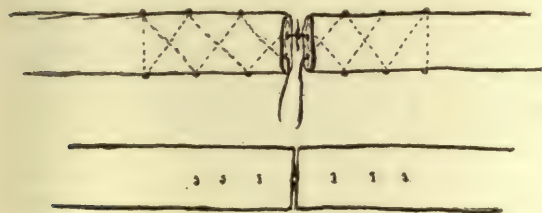


Fig. 5. Above: Course of silk through tendons and end-to-end tying. Below: Lateral view of end-to-end approximation of tendons; dots of silk are the only evidence of this method of suturing.

Sorrel, E.: Six Cases of Osteochondritis Deformans Juvenalis of the Upper Femoral Epiphysis (Six cas d'ostéochondrite déformante infantile de l'épiphyse fémorale supérieure). *Rev. d'orthop.*, 1921, xxviii, 31.

The author protests against the application of the name "Perthes' disease" to osteochondritis deformans juvenalis as this condition was first described by Legg of Boston in 1909 who reported 5 cases, and 10 cases were reported by Calvé before Perthes' article on the subject was published.

The author describes 6 new cases which are typical. In all, the condition was unilateral. In 4 it was on the left side and in 2 on the right side. In 2 cases it followed a trauma, while in 4 its onset was insidious. In 1918 Legg stated that a history of trauma was given in only about half the cases, while Méryne found it a factor in only 8 of 23 cases. The skin reaction was negative except in a boy 13 years old. At this age, however, the test is often positive. The reactions of Hecht and Bordet-Wassermann were negative in 4 cases.

W. A. BRENNAN.

Phemister, D. B.: Operation for Epiphysitis of the Head of the Femur (Perthes' Disease): Findings and Result. *Arch. Surg.*, 1921, ii, 221.

In the case reported operation revealed a mild synovitis and villous tags attached to the synovial lining. The articular surface of the head of the femur was normal but flattened. When the head was opened the center of ossification was seen to be almost entirely broken down so that a cavity filled with granulation tissue and necrotic debris and containing several sequestra had been formed. Cultures were found to be sterile.

The pathologic picture was that of an old, probably pyogenic infection which had destroyed most of the bony center of the head of the femur. Bone in all stages of disintegration and areas of new bone and fibrotic formation were discovered.

The cavity was curetted and the hip immobilized in plaster with a good result.

The author comments on the outstanding feature of this case which was the improvement brought about by the operation in the center of ossification of the head of the femur. Instead of further destruction and collapse, as is usual, it regained part of its original thickness, the contour of the articular surface became more even, and the interior was almost completely filled out with new bone.

The restricted nature of the infection can be accounted for by the anatomical arrangement. The center of ossification in the head is everywhere surrounded by a wall of cartilage which is not easily penetrated by an inflammatory process. The layer of cartilage between the bony center and the joint surface is very thick during the first decade of life and serves as a barrier against the spread of infection to the joint. This cartilaginous enclosure of the affected center explains also the mildness of the subjective symptoms. There is no nerve supply to the center of ossification as cartilage is not pene-

trated by nerve fibers; consequently there is relative insensitiveness of the joint.

H. A. McKNIGHT.

Marshall, H. W.: When To Open Knee Joints. *Boston M. & S. J.*, 1921, clxxiv, 291.

It is certain that arthrotomies with irrigation of joint cavities remove synovial accumulations which sometimes possess toxic properties, and that irrigating fluids exert some physiological influence on synovial linings. Incisions into joints relieve intracapsular pressure and tend to prevent the stretching of the capsule which would otherwise occur if it became distended with excess of synovial fluid.

Synovial accumulations may have two important functions: (1) the separation of the synovial surfaces, and (2) the protection of irritated synovial surfaces by reducing the mechanical friction in subsequent joint movements. When accumulated synovial fluid is purulent it undoubtedly contains toxic substances.

Synovial membranes at times successfully resist a considerable amount of sepsis within joint cavities and therefore the joints may be closed tightly after they have been washed out even though staphylococci have been present in the serous fluid.

Experience with penetrating wounds of knee joints in war injuries has shown that such knees may be left untreated for several weeks until the joint resistance has increased. Then they may be opened, cleaned out, and closed, with generally the best results. Synovial linings possess peculiarities analogous to those of peritoneal surfaces.

Sepsis of the joints of pyæmic origin may be overcome and the joints often restored to normal function to marked degree when joint drainage is avoided. Drainage is being found indicated less and less frequently. In the treatment of discharging joint sinuses early gentle massage is becoming more widely applied, even during the subsiding stages of acute inflammation, as it accelerates lymphatic circulation about the inflamed regions.

The character of synovial fluid varies within wide limits. It may be clear and straw colored, or turbid with cell debris, or it may contain a small amount of fibrin. In severe, very chronic inflammations there may be loose jelly-like moulds of fibrin filling the joints. Synovial fluid normally contains salts, proteids, a mucin-like substance, and water, and has a variable specific gravity.

Irrigating fluids possess different physiological influences, depending on their chemical and physical properties. If they are of proper chemical composition and correct concentration and temperature, and if they reach all parts and do not cause harmful mechanical irritation of the joint surfaces, the latter will probably be favorably stimulated to a slight degree by single applications. When the synovial tissues are already struggling unsuccessfully with increasing blood-carried toxins, their resistance may become very low and irrigation of the joint may

increase rather than relieve the condition. Clinical evidence does not disprove that a large percentage of irrigations are useless or slightly harmful in their direct influence on the synovial linings in early inflammatory processes in subsiding stages of acute synovitis.

Continued extreme capsular stretching by synovial accumulations should be prevented in order to avoid subsequent laxity of the ligaments and bacterial infiltration of the weakened joint capsules with resulting chronic inflammatory thickening. In this respect operations have a distinct advantage over non-operative measures, but large accumulations can be kept down by aspiration and tight elastic pressure.

The conclusions drawn by the author with regard to arthrotomies for synovitis are as follows:

1. Arthrotomies are generally harmless when done by skillful surgeons in hospitals, and excellent recoveries are the rule in non-purulent synovitis.

2. Early arthrotomies are unnecessary and harmless in non-purulent cases.

3. Late arthrotomies in slowly subsiding chronic knee inflammations possess distinct advantages as they permit exploration of the synovial linings, the removal of fibrinous clots, etc.

4. In selected cases excessive conservatism in arthrotomies should be avoided because of the harmlessness and positive benefits of the procedure.

5. Conclusions derived from the illustrative case reported in this paper are that it is impossible to decide from clinical data alone whether surgery has prolonged or shortened the patient's disability.

Villous arthritis is characterized by chronic hypertrophy of the synovia, including the synovial villi and fringes which occur normally in knee joints, and is evidenced by the presence of an unusual crepitus on joint movement as the hypertrophic tissues interfere with each other or become pinched between the bearing surfaces.

The causes of the initial thickening of the joint lining include traumata, toxæmias, and bacterial infections or their combinations. Pedunculated or free joint bodies may be formed by the continued mechanical friction of normal joints following irritation or the pulling out of folds of joint lining.

Well-developed villous arthritis may terminate as follows:

1. Subsidence and complete restoration of joint function usually result after a variable number of months, depending upon the severity of the villous hypertrophy and the efficiency of treatment.

2. Hypertrophic synovia may cause continued interference with joint function for one year or longer because of repeated new injuries, continuance of the toxæmia or infection, neglect of treatment, or their combinations.

3. These factors result in increasing joint effusions which subside alternately, depending on fluctuating amounts of irritation. Capsules weaken and stretch or thicken if they become chronically inflamed by infiltration of micro-organisms. There

may be considerable activity for years, nevertheless, and a few patients may manage to endure without ceasing their usual occupation and without proper medical care.

4. Tuberculous disease may develop in thickened synovial linings at any period in the course of knee inflammations. In some instances it may be the initial cause of synovitis.

5. Pedunculated villi or detached loose bodies may gradually lodge in comparatively non-obstructing positions from which they emerge at irregular intervals to produce intermittent acute symptoms. Occasionally they become adherent in a non-obstructing position and more permanent relief is then obtained.

6. Operations are performed with benefit in many instances and in all stages of villous hypertrophy and are more often indicated in this condition than in synovitis.

Operations for villous arthritis are dependent upon the patient's occupation and position in life and upon the severity and chronicity of the symptoms, etc. When operations are performed the following clinical results are possible:

1. Marked relief may result immediately from removal of pedunculated villi or loose bodies after the wounds have healed and walking is resumed.

2. Occasionally it seems apparent that too much synovial tissue and supracondylar fat is removed, especially in the less severe types. Patients then complain of a sensation of weakness persisting for long periods and have difficulty in stepping up or down.

3. Extremely gradual changes for the better or worse may take place after the operations. These should not be interpreted as the results of surgical interference. They usually occur in middle-aged persons whose joints show definite osteo-arthritis changes.

4. When in the cases of vigorous young adults arthrotomy with excision of thickened synovial tissue is performed skillfully, a perfect recovery of joint function very often results. Many arthrotomies done for villous arthritis are probably unnecessary though harmless, especially in the earlier stages.

Loose semilunar cartilages may interfere with joint motion in the same way as pedunculated villi. After recurring attacks of acute symptoms the removal of cartilage fragments is promptly followed by decided relief. Occasionally partly loosened cartilages fall back into normal position and reattach themselves without causing interference. Conservative methods should be employed in many instances of cartilage dislocation.

No precise indications can be given for opening the knees after fractures or the rupture of the crucial ligaments.

Tuberculosis of the knee joint in adults should be treated by joint excision immediately after the diagnosis is confirmed by microscopic examination. Following this operation the general health usually

improves. When excisions are not made the tuberculosis continues to cause intermittent or constant trouble and disability for some time.

Operations have been devised to restore motion in completely ankylosed joints resulting from non-tuberculous infections by means of animal membranes and fascia after adhesions have been loosened. On the other hand, painful knees with great limitation of motion are sometimes ankylosed and made painless by operations such as those performed for tuberculous knees.

No knee joint should be opened unless proper facilities for strict surgical asepsis are available. Postoperative infections develop occasionally after surgical asepsis. Possibly these are due to blood infection, to long, clumsily executed operations on joint tissues with lowered resistance subjected to much handling, or to the use of very strong local applications for sterilization.

Arthrotomies are contra-indicated in the cases of many middle-aged patients with chronic hypertrophic arthritis as they may accelerate rather than retard the condition. The same statement applies to Charcot knees. Hæmophilic joints should not be opened, and there are numberless borderline cases which should receive careful consideration from the point of view of the patient's probable future activities before arthrotomy is performed.

R. S. REICH.

Roux-Berger, J. L.: Surgery of the Knee: Menisci, Crucial Ligaments, and Articular Cartilages.
Am. J. Surg., 1921, xxxv, 54.

The recognition of the traumatic lesions of the menisci, crucial ligaments, and articular cartilages has made little progress in France. These lesions are rarely diagnosed and rarely operated upon. Roux-Berger believes, however, that they are an important, if not the most usual, cause of certain chronic conditions of the knee which are still being treated without surgical efficiency. In his opinion relief can be obtained only by surgical repair of the causal injury.

The failure to recognize these lesions cannot be explained by their comparative infrequency in France as compared with the Anglo-Saxon countries. The fault appears to be due to the inadequacy of arthrotomies performed and to the tendency to over-emphasize the importance of the menisci.

The lateral, vertical, and horizontal incisions are sufficient to expose the meniscus but that is all. Two methods of arthrotomy are at our disposal, both of them good and both permitting perfect restoration of the joint. Vertical, median, transpatellar arthrotomy is simple. It gives perfect exposure by permitting the dislocation outward of each half of the patella onto the anterior surface of the femoral condyles. In the second method a large U-shaped flap is formed, the horizontal branch of which passes beneath the tubercle of the tibia which is cut with a chisel or Gigli saw. A large flap consisting of the insertion of the patellar liga-

ment, the patellar ligament, the patella, and a portion of the capsule can then be raised upward. The advantage of this method is the absence of bleeding, but the operation is longer than that performed by the first method. In order to obtain a good functional operative result it is absolutely essential that the suture of the synovia, capsule, muscle, and prepatellar tissue be carefully performed with fine suture material.

The author reports two cases, both those of adults with typical histories. Locking was present in both instances and associated with the usual symptoms of sudden pain and limitation of motion. In the first case operation was performed through a simple lateral incision, while in the other a transverse incision dividing the patellar ligament was made. The first incision was insufficient, the second was mutilating. Therefore Roux-Berger now prefers either the vertical section of the patella or the detachment of the tubercle of the tibia. In both cases the internal meniscus was found completely detached and in one it was twisted on its axis and filiform in thickness.

A review of the recent literature on injuries of the crucial ligaments seems to show that while in France the tendency has been to operate too little, in England the contrary is true. Over-emphasis on the importance of lesions of the meniscus has led to the removal of many healthy menisci. The pathognomonic symptom of a torn or dislocated meniscus is a painful locking of the joint. The other symptoms, hydrarthrosis, atrophy, and weakness, are secondary and occur also in other pathologic conditions of the knee.

In reviewing the abundant statistics published by the English one is struck by the fact that whereas the results have been remarkably good in those cases in which the meniscus was definitely torn or displaced, they have been very mediocre or poor in those cases in which the lesion was not definitely present. Moreover, as pointed out by Smith, a true lesion of the meniscus may be associated with a tear in the anterior crucial ligament. It is therefore conceivable that ablation of the meniscus alone without further exploration has been responsible for a certain number of failures even when a torn meniscus was definitely repaired. Wide access to the joint will minimize the number of errors. Therefore whenever arthrotomy is performed the exposure should permit satisfactory exploration.

Without going into the details of the physiology of the crucial ligaments, the author states that the important fact to be borne in mind is that these ligaments are the strongest connections between the tibia and the femur. Any weakness causes laxity in the knee joint. The syndrome of torn meniscus is characterized essentially by pain, while that of a tear of the crucial ligament is laxity and weakness. Nearly always it is the anterior crucial ligament which is affected.

The author reports two cases, describing the condition of the ligaments in each and giving his

own technique of treatment. He reviews the operations ordinarily done for this condition, dealing especially with that recommended by Smith. He describes one case also in which there was a fracture through the articular cartilage and the fragments acted as free foreign bodies. In this case wide exposure by a U-shaped incision was necessary to clear up the diagnosis.

The article is illustrated by diagrams and photographs.

L. D. PRINCE.

ORTHOPEDICS IN GENERAL

Lange, F.: The Implantation of Foreign Bodies in Orthopedic Surgery (Die Fremdkörperimplantation in der Orthopaedie). *Jahresb. f. aerztl. Fortbild.*, 1920, xi, 47.

The method of plastic surgery introduced by Gluck in 1883 has long since been adopted by most surgeons. Poor results are generally due to the use of the wrong kind of material. Metals, even silver, are irritants. Tin, however, is less irritating than other metals, and celluloid, horn, and ivory cause no trouble if they are fastened so that they do not move. Twisted silk boiled in 1:1,000 oxycyanate of mercury and paper are very good materials.

Lange used artificial tendons made of silk in 694 cases. The silk was discharged as a foreign body in only 3 per cent. This occurrence was most frequent during the earlier operations and was usually due to technical errors. In the other cases connective tissue grew around and through the silk, which often took on the character of true tendon tissue. As the muscles were used the connective tissue covering increased in thickness.

Lange used silk also to replace joint ligaments in cases of paralysis. In a case of paralytic club-foot six to eight strong silk threads were passed from the tibia to the scaphoid bone and from the fibula to the cuboid, fastened to the periosteum or to holes bored in the bone, and tied so that the foot was held at 110 degrees plantar flexion. Among 98 cases healing did not occur with the silk in place in 8, and a recurrence developed chiefly because of technical mistakes in 15. In cases of flail joint of the knee there is nothing to take the place of silk as transplanted flaps of fascia can never be stretched tight enough and in addition there is the danger of necrosis. Too great demands cannot be made on rigidly fastened joint ligaments in paralyzed limbs. Even the natural joint ligaments give way when they are not supported by the muscles.

In cases of spondylitis Lange first splinted the spinal column with two soldered steel bands, but later used staves of celluloid, horn, or ivory 15 to 20 cm. long. The muscles were freed from each side of the spinous processes and where the spinous processes arise from the vertebrae a staff was fastened with strong silk threads to holes bored in the process. Lange believes the transplantation of a piece of tibia is not as good for the following reasons:

1. It is difficult to make a fissure in the spinous processes big enough to insert the bone; frequently the processes are broken off in the attempt.

2. In order to adapt it to the curve of the gibbus the piece of tibia must be broken and therefore it does not give firm support until after the fracture is healed.

3. The pieces of tibia are generally not long enough to keep the part of the spinal column above the gibbus from sinking forward.

4. In Albee's method a plaster cast is necessary at first while in Lange's method there is sufficient firmness without it.

To avoid adhesions in tendon transplantation, which often counterbalance all the good results, Lange interposes a thin layer of paper between the tendon and bone. In the first 100 implantations the paper was discharged only twice; in all the other cases it served its purpose. In animal experiments the paper was gradually absorbed. In men a cyst filled with brownish yellow fluid in which remnants of the paper floated was found after nine or ten weeks. The formation of such a bursa-like structure indicates that the tendon becomes more movable from month to month. It is probable that the movement of the tendon causes the cyst formation.

NAEGELSACH (Z).

Schauffler, R. M.: The Curative Play System of the Children's Mercy Hospital of Kansas City, Missouri. *J. Orthop. Surg.*, 1921, n. s. iii, 98.

The natural spirit of play in children is directed in such a manner that the physical defects are cured or improved. For instance, a child with adductor spasm of the thighs is encouraged to ride astride a hobby horse, or a boy who has been unable to walk is given a kiddie car to develop his leg muscles. The chief requirements of the system are that the exercise must be curative and at the same time it must be fun for the child.

The orthopedic surgeon prescribes the exercise needed and an aid, called the "play teacher," carries out the prescription. An accurate record of percentage muscle strength, range of joint motion, and degree of deformity is made before the treatment is begun. The exercises must be individual at first, but as the child progresses he enters into games, races, and other contests. For example, a boy with paralyzed legs, but with latent power, begins by walking on his knees on a gymnasium pad, supporting himself with his arms through swinging rings. Next he may run a race with another boy between low parallel bars which serve for support. He then may play war in a sand trench, kneeling behind the parapet and shooting over it with a toy gun. He may soon acquire the power to stand on his knees and is then ready for leg braces.

A playground is planned at the Children's Mercy Hospital where all the familiar toys will be found and where the play will be directed for the physical correction and development of the crippled child.

W. A. CLARK.

Levick, G. M.: The Action of the Intrinsic Muscles of the Foot and Their Treatment by Electricity.
Brit. M. J., 1921, i, 381.

The author first considers the muscular supports of the arches of the foot. In maintaining the longitudinal arch, the flexor brevis digitorum is most important. It draws the heel toward the toes, acting as a bowstring. The flexor longus hallucis and the flexor longus digitorum also serve to raise the longitudinal arch. The transverse arch is maintained chiefly by the dorsal interossei. These muscles with their bipennate origins draw the metatarsal bones together. Each metatarsal is drawn toward the second, which acts as a key stone. The alignment of the metatarsals with the cuneiform bones also helps to hold the arch. The flexor brevis hallucis, pulling from the cuboid to the first phalanx of the great toe, probably assists in supporting the transverse arch. The muscular support of the arches may be demonstrated by faradic stimulation of the muscles of the foot.

Faradic stimulation is successfully used as a therapeutic agent for wasted and unhealthy muscles. The foot is placed in sufficient warm water to reach just below the external malleolus. To stimulate the intrinsic foot muscles supporting the longitudinal arch, the heel is placed on one carbon electrode while the other electrode is held in the water in front of the toes. The core of the coil is manipulated so that a surging faradic current streams through the muscles.

The long flexors of the toes may be stimulated through their several motor points. The muscles of the transverse arch may be caused to contract by placing one electrode on each side of the front of the foot. The arches may be seen to rise and fall during the stimulation of the muscle groups.

Faradic stimulation can be used to advantage in the treatment of the preliminary stage of flat-foot. The wearing of narrow and high heeled shoes is the cause of foot troubles common to almost the whole of civilization. The splintage of a foot in a tight boot causes atrophy of the intrinsic muscles. The tarsal joints also suffer from the impaired circulation. Walking in the fashionable shoe entails the relaxation of all arch-raising muscles.

Faradization is recommended after surgery and preliminary to voluntary exercises. It is often impossible to develop small atrophic muscles by voluntary exercise alone, especially when the foot has been repostured by surgical means and the wasted overstretched muscles are relaxed. Improved nutrition is necessary before satisfactory voluntary exercises can be carried out.

In the treatment, care and intelligence must be exercised. The muscles must not be over-fatigued; the stimulation periods must not be too long; periods of complete relaxation must come between the contractions. The author considers a Smart-Bristow coil essential for the best results.

HUGH T. JONES.

SURGERY OF THE SPINAL COLUMN AND CORD

Storey, C. L., and Birkelo, C.: Congenital Dorsal Scoliosis Due to a Spinal Defect: Report of Case. *J. Am. M. Ass.*, 1921, lxxvi, 786.

The authors give the views of different orthopedic surgeons regarding the term "congenital scoliosis." Putti's classification of congenital deformities of the vertebræ and ribs is as follows: (1) numerical variations in the column as a whole; (2) morphologic variations in individual elements of the vertebral column; (3) numerical plus morphologic variations; (4) faulty differentiation not only in the metameric but also in the regional differentiation, and (5) pathologic malformation.

The case reported is one of numerical plus morphologic variation. According to reports from the literature, the degree of defect both numerically and morphologically decreases according to the distance of the part from the transition regions of the spine.

F. K., a girl 8 years of age, complained of elevation of the right shoulder which had been present since birth. No family history of congenital defects was given. The child had always been delicate and subnormal in weight and size.

The general examination was negative except that indications of active tuberculosis were noted in both pulmonary apices. The child had round shoulders, a flat chest, and a prominent abdomen.

The right shoulder was carried higher than the left. The spinous processes of the sixth, seventh, and eighth dorsal vertebræ were rather sharply displaced to the right. No secondary curves were noted above or below. The flexibility of the spine was somewhat limited in the mid-dorsal region. Twelve ribs should be palpated on the right side and twelve on the left. The upper left rib appeared to be attached to the seventh cervical vertebra. Only eleven dorsal spinous processes were palpable.

Stereoscopic plates showed that the seventh cervical vertebra had a fully developed rib on the left side and a short rudimentary rib on the right side.

The eighth dorsal vertebra was rudimentary and consisted of a small triangular body with a unilaterally developed pedicle wedged in between the seventh and the ninth vertebræ on the right side. The transverse and spinous processes were in no respect different from the corresponding parts on the other vertebræ above and below it. A fully developed rib articulated with it on the right side, but there was no sign of a corresponding rib on the left side. Thus there were twelve fully developed ribs on each side but the first rib on the left was cervical. There was dorsal scoliosis to the right with the apex of the curve at the eighth dorsal vertebra, the rudiment of which was the sole cause

of the scoliosis. There was no rotation of the bodies of the vertebræ. The spine was otherwise normal.

F. G. MURPHY.

Erlacher, P.: Gibbus After Tetanus (Ueber Gibbusbildung nach Tetanus). *Ztschr. f. orthop. Chir.*, 1920, xl, 385.

Erlacher reports 8 cases from the literature and 3 new cases of tetanus which led to bone deformities, chiefly of the spinal column. In all of these cases the deformities were observed during or soon after the attack. In children the tetanus was acute while in adults it was late tetanus. In 8 cases the gibbus was between the fourth and sixth dorsal vertebræ and in 2 between the second and third lumbar vertebræ. In one case there was a fracture of the neck of the femur.

In 2 cases the spinal column deformity disappeared after the attack; in 2 others it persisted without causing any visible structural changes in the bones; in 6 cases there were spinal fractures. The parts of the spine between the fourth and the

sixth dorsal and between the second and the third lumbar vertebræ, Erlacher states, are the weakest parts as they form the vertex of the kyphotic or lordotic spinal column; therefore they are more apt to be involved in injuries.

Spieß, who had an opportunity to examine one of the cases after a year, concluded that the gibbus is tubercular. Erlacher does not agree with him, and cites the case of fracture of the neck of the femur as proof that the force of the muscles alone may produce a compression fracture. He admits, however, that the bones probably became poor in calcium as the result of the tetanus and therefore they gave way to the action of the muscles more easily than normal bones. He regards compression fracture as a sort of plastic correction.

Slight scoliosis in many cases is not caused by unequal involvement of the muscles on the two sides but may very well be due to yielding to the compression on one side. Correction with the application of Calot's plaster cast is recommended for the treatment of gibbus.

PORT (Z).

SURGERY OF THE NERVOUS SYSTEM

Naffziger, H. C.: Methods to Secure End-to-End Suture of Peripheral Nerves. *Surg., Gynec. & Obst.*, 1921, xxxii, 193.

Within the past eighteen months 100 cases of peripheral nerve injury have come under the author's observation. In the first 10 cases two main trunks were believed to have gaps too great for end-to-end suture. In these, "auto cable grafts" were used. In the later cases no grafts were used for the main nerve trunks as end-to-end suture in a one- or a two-stage operation was possible. Moreover, one of the earlier cases in which a graft was inserted was again operated upon, the graft being removed and the nerve sutured end-to-end.

The following methods were found most useful in obtaining apposition of the divided nerve ends: (1) free mobilization of the proximal and distal portions of the nerve; (2) transposition of the nerve to a shorter route than the normal route; (3) placing the extremity in a favorable posture to shorten the distance to be overcome; and (4) gradual lengthening of the nerve by a two-stage operation.

Free mobilization of the nerve necessitates long incisions. Small incisions and forcible stretching of the nerve produce unnecessary trauma and do not secure the greatest lengthening. After the involved area is freed, the condition of the nerve will determine the further operative procedure. When suture is to be performed and mobilization of the nerve is desired, gentle traction on the scarred ends will show the points of attachment of the nerve sheath, and they may then be freed by sharp dissection.

The author has employed the second method in cases of ulnar paralysis. There are no branches of

the ulnar nerve given off in the arm. When the ulnar nerve at the elbow is transplanted from behind the condyle to the flexor surface in the bend of the elbow, the route is slightly shortened and a gain is made. To secure the greatest mobility it is necessary to extend the incision sufficiently far to free the nerve well above and at the point where it pierces the internal intermuscular septum. In changing the position of the ulnar nerve it has seemed more satisfactory to place it beneath a covering of the deep fascia and muscles and to give it an absolutely straight route.

Lesions of the musculospiral nerve are frequent but the results of treatment are better than those of lesions of the other peripheral nerves. In lesions of the musculospiral nerve much can be gained by altering the position of the arm. In certain instances transposition of the nerve to a position in front of the humerus is desirable. This is particularly applicable to cases in which there has been an extensive injury to the posterior surface of the arm with extensive scar involvement of the triceps and the posterior surface of the humerus. For the transposition two incisions are necessary. In the lower half of the arm the nerve is exposed by an incision on the outer side, extending downward in the bend of the elbow to the mesial side of the external condyle. The second incision is made over the brachial sheath in the upper half of the arm on the inner side. The musculospiral is exposed at the lower margin of the *teres major* where it passes behind the humerus and between it and the long head of the triceps. The long branches of the musculospiral nerve to the triceps are in full view and if necessary can be dissected up for some distance along the course of the nerve. The nerve is then

brought out of the musculospiral groove and passed behind and to the outer side of the axillary vessels and the median and ulnar nerves. The biceps is dissected free so that an oblique position of the musculospiral is permitted beneath it. The nerve then runs directly from the axilla in front of the humerus, lying beneath the biceps and emerging about $2\frac{1}{2}$ in. above the lower end of the humerus on the outer side. The branches to the outer head of the triceps are sacrificed. Such a transposition gives a slight gain and in addition the arm may be placed in a more favorable position to make a gain from adduction, flexion, and internal rotation at the shoulder with flexion at the elbow.

In the case of the median nerve some lengthening may be obtained by dissecting the muscular branches in the upper forearm upward and transposing them to a more superficial position.

In the lower extremity the course of the sciatic nerve is such that a shorter course cannot be obtained by transposition. This also applies to the two subdivisions of the sciatic nerve.

It is fortunate that the main nerve trunks in the extremities lie for the most part on the protected flexor surfaces. When this is not the normal position of the nerve throughout its entire course, as in the musculospiral and ulnar nerves, it can be obtained by transposition. Because of this fact, flexion of certain joints will relax the nerves and in a position of flexion the distance bridged by the nerve will be shortened. An otherwise unbridgeable gap may be overcome and end-to-end suture of the nerve may be effected by flexing the neighboring joints.

In a small number of cases in which it has been impossible to obtain an end-to-end suture at a one-stage operation the author has employed the two-stage operation. If it is obvious that end-to-end suture is impossible, the fibrous ends of the proximal and distal nerves are overlapped as far as possible and sutured in this position, and the wound then

closed. The posture of the extremity is maintained by a cast or splints; later, gradual extension of the part is permitted until there is normal freedom of movement and the normal range of motion is acquired. In the second stage of the operation, which is usually not performed before two months after the first, the suturing is accomplished. The scarred portion is resected. The part is again put in a favoring posture and the end-to-end suturing is done as in a one-stage operation.

In nerve suturing the essentials of technique are delicacy of handling, accurate suturing without tension, the use of a minimum amount of foreign material, and the proper protection of the parts afterward.

Regarding protection of the suture line, the author states that any foreign material or any free graft favors the production of fibrous tissue and that the most desirable bed for a line of nerve suturing is against the uninjured muscle and preferably between muscle planes. Soon after wound healing has occurred he uses heat and gentle massage over the site of the suture.

Opinions as to the length of time a favoring posture of the extremity must be maintained after nerve suture vary widely.

Injuries of the main nerve trunks of the upper and lower extremities are more frequent than injuries of their subdivisions. With rare exceptions, their repair can be effected by end-to-end suture. A much smaller number of peripheral nerve injuries occur to the subdivisions of the main trunks. Often associated with these are extensive injuries to muscles and tendons and consequently large scars. By the use of a nerve graft 10 cm. in length from the same individual the author secured regeneration with consequent improvement in sensation and return of voluntary power in the muscles supplied. In this particular case he later excised the graft and secured an end-to-end suture.

G. W. HOCHREIN.

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Mott, F.: The Neurological Aspects of Shock.
Lancet, 1921, cc, 519.

Shock is defined as a condition of profound exhaustion and prostration of voluntary and involuntary functions of acute onset caused by trauma, operations, disturbance of the central nervous system, or the effects of toxic agents and anaphylaxis. Over-stimulation and exhaustion of the central nervous system play an important part in its production. Two forms are recognized, primary, often called "collapse" or "faint," and secondary. The former is due to emotional disturbances and the latter to toxic factors in addition to the afferent impulses which exhaust the vital medullary centers of respiration and circulation.

Anaphylactic shock, which is somewhat different from these, may be defined as a dislocation of the static equilibrium of all the cells of the body. In all forms of shock the blood pressure falls. When death occurs it is due to failure of the centers of respiration and circulation.

Persons who are neurotic or timorous by nature and those whose higher controlling centers are exhausted by prolonged stress and strain are most susceptible to emotional shock. In addition to sudden emotional shock, fear may be an important factor and prolong the condition. Hysteria and neurasthenia may follow. Hysterical symptoms are curable by contra-suggestion. Observations in cases of commotional shock distinct from emotional shock have shown that the cerebrospinal fluid is under increased pressure and contains protein. Occasionally blood is found. In some cases of

commotional shock death results without visible injuries to account for it. Microscopic examination of the brain might give evidence concerning the real cause.

Exhaustion by over-stimulation of the neuro-potential of the ganglion cells has been demonstrated by the staining reaction. Crile gives a theory of the inter-relation of the brain, the thyroid, and the adrenal glands in shock. He believes that "common sensibility environmental stimuli reach the brain through the special senses and cause it to liberate energy which directly or indirectly activates muscles and glands, among others the thyroid and adrenal." Cannon and Elliot have shown an increased quantity of adrenalin in the blood during fear and anger.

Conditions indicative of cerebral anæmia have been found in all cases of fatal shock whether primary or secondary. In most instances there was a wet condition of the brain and in a few cases the superficial veins were congested. Microscopic examinations showed: (1) empty collapsed vessels in the substance of the brain with dilatation of the periadventitial and perineuronal spaces; (2) chromatolysis of the brain cells most marked in the autonomic nuclei of the medulla oblongata and to a lesser degree in the bulbospinal motor nuclei; (3) a similar effect on the pyramidal cells of the cortex and the cells of Purkinje. These confirm Crile's findings.

Porter believes shock to be due to fat embolism as he found it present in the brain in several cases of surgical shock. This may be a contributory cause but not the sole cause.

A more important cause of secondary wound shock is the absorption of histamine or toxic substances from the damaged muscles. Arguments favoring this theory are that men suffering from pure muscle injury have died of shock, that improvement may follow amputation of a lacerated limb, and that experimental shock in animals has been produced by Bayliss by damaging the muscles under ether.

Dale has shown that injection of histamine will produce shock. In such cases the condition seems to be due to a slow poisoning of the vital centers.

The theory which ascribed shock to an accumulation of blood in the capillaries and veins of the abdominal organs has been rejected. Cannon has shown that there is a concentration of the blood and stasis in the capillaries due to exudation of the plasma through the capillary walls into the tissues. This is proved by an increase in the hæmoglobin index and the blood-cell count. Cannon calls this condition "exemia."

In the treatment of this condition intravenous salines prove useless. Citrated blood and gum acacia have raised the blood pressure and led to recovery. Crile recommends the introduction of fluids by natural methods, Murphy drips, etc. Stimulants are useless.

In resuscitation from surgical shock experience shows that the treatment of lowered blood pressure, lowered temperature, and decrease of blood volume yields satisfactory results.

MERLE R. HOON.

SERA, VACCINES, AND FERMENTS

Barker, L. F.: *The Classical Endocrine Syndromes.* *N. York M. J.*, 1921, cxiii, 353.

The four most common signs in Graves' disease, often spoken of as the cardinal symptoms, are: (1) persistent tachycardia; (2) struma; (3) marked fine tremor, and (4) protrusion of the eyeballs or exophthalmos.

Disturbances of autonomic innervation in Graves' disease appear to be responsible for the symptoms referable to the eyes, the heart and blood vessels, the skin, the digestive system, the respiratory system, and the urogenital system. The autonomic nervous system, it will be recalled, consists of two parts—the sympathetic system and the craniosacral or so-called vagal autonomic system. Both of these systems appear to be disturbed in Graves' disease, but in some cases sympathicotonic symptoms predominate while in others vagotonic symptoms are uppermost. In most patients the symptoms indicate the involvement of both sympathetic and craniosacral systems (mixed cases).

Prolonged thyro-intoxication leads to degenerative change in the heart muscle, dilatation of the heart, and sometimes atrial (auricular) fibrillation with its characteristic sign, a constantly irregular pulse.

Acceleration of the metabolic processes is one of the most important of the clinical phenomena noted in Graves' disease.

Loss of function or insufficient function of the thyroid gland (athyroidism and hypothyroidism) are associated with peculiar symptoms including: (1) leather-like thickening of the skin, (2) falling out of the hair, (3) mental dullness and torpor, (4) sensitiveness to cold, (5) obesity, (6) constipation, (7) marked slowing of the metabolic processes, and (8) in the more pronounced cases, mucus-like œdema of the skin.

The clinical syndrome known as tetany may be either manifest or latent. In manifest tetany there are spontaneous attacks of peculiar tonic spasm which may be limited to certain groups of muscles or involve the whole body musculature. In latent tetany these spontaneous attacks of tonic spasm are not present, but there is a peculiar hyperexcitability of the nervous system and the attacks of tonic spasm can be easily elicited by artificial means. In manifest tetany the spontaneous attacks of intermittent tonic contractions involve groups of muscles innervated by certain nerves and result in the assumption of certain definite attitudes by the extremities.

If a cathodal opening contraction (KOC) occurs with a current below 5 ma. in strength, we can be sure that there is increased galvanic excitability of the motor nerves.

Trousseau pointed out that in the intervals between attacks of manifest tetany the application of a ligature firmly about the upper arm will soon be followed by the typical attitude of obstetrical hand.

Chvostek's sign is easily elicited when the mechanical excitability of the motor nerves is increased as it is in tetany. One simply taps the region of the pes anserinus of the facial nerve with the tip of the finger or with a small percussion hammer and notes whether this stimulation is followed by contraction of the muscles of the same side of the face. Poole observed in tetany a constant response of contracture of the muscles of the upper extremity upon forcible abduction of the arm and of contracture of the muscles of the lower extremity upon forcible flexion at the thigh of the lower extremity extended at the knee.

The thymus gland belongs to the hormonopoietic system as it produces substances of importance for growth and for the proper functioning of other organs, especially in early life. Over-activity of this gland in childhood, its persistence for an abnormally long time, or its reviviscence in adult life may be responsible for serious symptoms. Clinical syndromes due to over-function of the thymus gland are generally recognized. They have been described by various terms, including "hyperthymismus," "status thymicolymphaticus," "asthma thymicum," and "mors thymica."

In children presenting status thymicolymphaticus there is usually enlargement of the tonsils and the lymphadenoid tissue generally. An enlargement of the thymus gland can be made out on percussion or X-ray examination of the chest. Such children often suffer from what their parents regard as attacks of holding the breath which are, in reality, seizures of asphyxiation. Status thymicolymphaticus usually exhibits a pronounced lymphocytosis in the blood.

It is generally believed that gigantism and acromegaly are due to an over-function of the hypophysis cerebri, and that one form of dystrophia adiposogenitalis is due to under-function of the same gland. The hypophysis cerebri consists of three parts: (1) the anterior lobe; (2) the posterior lobe, and (3) the pars intermedia. The anterior lobe is glandular and the posterior lobe nervous, whereas the pars intermedia consists of an epithelial layer covering the anterior surface of the posterior lobe. The anterior lobe probably produces substances having to do with the growth of bone and substances which determine, perhaps through the intermediation of the gonads, the development of the secondary sex characters. It is probable that the epithelium of the pars intermedia manufactures pituitrin or infundibulin. The posterior lobe or nervous part is made up chiefly of neuroglia, but this contains in its meshes colloidal or hyaline masses which may possibly represent an internal secretion discharged into the cerebrospinal fluid. Some believe that this colloidal substance found in the pars nervosa is a secretion which is derived from the cells of the pars intermedia.

When there is over-function of the hypophysis during the developmental period, before the epiphyseal lines of the long bones have closed, gigantism results. When over-function occurs later

in life the clinical syndrome known as acromegaly develops.

When for any reason there is an insufficiency of hypophyseal function during development, a peculiar syndrome known as Froehlich's syndrome, or hypophyseal dystrophia adiposogenitalis, develops. The patient becomes obese and the fat as a rule has a peculiar distribution; it is most abundant on the abdomen, buttocks, and proximal portions of the extremities. The skeletal development is faulty. This may appear as acromicria, or if the hypopituitarism occurs very early, as dwarfism. The secondary sex characters fail to develop or if they develop they present an abnormal appearance. The genital organs remain in a hypoplastic or infantile state. The skin of the body as a whole is usually pale, thin, soft, and smooth.

Syndromes due to tumors and cysts involving the pineal body and its neighborhood give rise to symptoms of increased intracranial pressure, to focal symptoms referable to the midbrain, and to certain symptoms believed to be due to disturbances of internal secretion, namely, premature puberty and changes in carbohydrate tolerance.

Addison's disease, underfunction of the chromaffin system, is easily recognizable when fully developed by the asthenia, the melanoderma, the diarrhoea and other disturbances of the digestive system, and the arterial hypotension to which it gives rise. In the pure chronic cases the fatal determination is often delayed for years. In the early stages of Addison's disease and in its incomplete forms the diagnosis may be exceedingly difficult. The disorder is sometimes confused with hæmochromatosis, arsenical pigmentation, pellagra, Graves' disease, cachexias of various sorts, and certain skin diseases associated with pigmentation.

Pseudohermaphroditism is supposed to be due to a congenital form of hyperinterrenopathy. In other words, the endocrine disorder of the cortex of the suprarenal gland or of some interrenal rest in an adjacent organ is believed to begin in these cases before birth. Certain females whose internal sex organs resemble those of a normal female present external genitals resembling those of the male, and certain males, whose internal sex organs resemble those of the normal male, have external genitals resembling those of the female. The important facts to be remembered in the diagnosis of pseudohermaphroditism are: (1) that the true sex of the person depends upon the character of the internal sex organs, and (2) the external genitals of the pseudohermaphrodite usually resemble those of the sex opposite to that to which the person belongs.

Premature puberty (*pubertas præcox*) is believed to be an early postnatal form of hyperinterrenopathy. The child, which appears normal at birth and perhaps for a brief time afterward, soon becomes obese; it exhibits also an abnormally rapid growth and a premature development of the secondary sex organs, the external genitals especially undergoing changes which correspond to those of puberty.

In the syndrome of adult hirsutism or virilism it is believed that we have to deal with a late or adult form of postnatal hyperinterrenopathy. Women between 16 and 20 are most often affected, though the disorder may appear at any time between puberty and the menopause. Strong physically, these women often suggest the masculine type, the hyperasthenia in them being in marked contrast to the asthenia of Addison's disease. There may be marked hypertrophy of the clitoris. Certain peculiar mental symptoms also suggestive of masculinity (egotism, an overbearing tendency, aggressiveness) may also appear. These physical and mental traits are known as virilism.

The pancreas, besides producing an external secretion, possesses tissue (the islets of Langerhans) which manufactures an internal secretion necessary for the normal metabolism of carbohydrates. The relation of diabetes mellitus, in many instances at least, to destruction or diminution of function in the islets of Langerhans in the pancreas is now well established.

The interstitial cells of the testes and the ovary are believed to produce hormones of great importance for the rest of the body. Over-function of the internal secretion of the gonads is known as hypergenitalism. This in turn is usually secondary to over-activity of the interrenal system, but may sometimes be due to primary gonadal disease. Among the syndromes of gonadal origin the author refers briefly to eunuchism, eunuchoidism, and the climacteric phenomena which are believed to be due to loss of function or diminution of function of the internal secretion of the gonads (agenitalism, hypogenitalism).

The phenomena of the menopause consist on the physical side of a slowing of metabolism with a tendency to obesity coincident with the cessation of menstruation and the signs of excitation or of loss of inhibition in autonomic domains (hot flushes; respiratory, cardiac, and digestive disorders). Mentally, marked neurasthenic, psychasthenic and even psychotic symptoms may be exhibited.

M. H. KAHN.

Lisser, H.: Does the Pituitary Secretion Influence the Development of the Prostate? *N. York M. J.*, 1921, cxiii, 391.

It is now well known that hypopituitarism prior to puberty is associated with hypoplasia of the genitalia. The literature contains many reports of such cases and of corroborative animal experiments. Little notice, however, seems to have been taken of the status of the prostate in this condition.

The author reports the cases of five boys who exhibited many signs and symptoms which in the light of our present knowledge justified a diagnosis of pre-adolescent hypopituitarism either of the Levi-Lorain (3 cases) or the Froehlich types (2 cases). In all of these boys the prostate gland was either entirely absent or exceedingly diminutive, being

just barely palpable by rectal examination. The presence of aberrant prostatic tissue, however, could not be excluded. The ages of the boys were 10, 10, 14, 15 and 18 years respectively. Their corresponding mental ages were 3, 3, 7, 9, and 8 years.

In feeding experiments upon hypophysectomized rats, Goetsch, in 1916, found that anterior lobe stimulates the growth of the prostate while posterior lobe does not. This fact suggests that the normal development of the prostate is in part at least dependent on normal pituitary secretion.

M. H. KAHN.

BLOOD

Weiss, E., and Dieter, W.: The Blood Flow in the Capillaries and its Relation to Blood-Vessel Function. (*Die Stroomung in den Capillare, und ihre Beziehung zur Gefaessfunktion*). *Zentralbl. f. Herzkrankh.*, 1920, xii, 295.

The capillary current was studied by means of the Weiss apparatus. To observe the vessel function alone a closed vascular region was produced by the use of the Riva-Rocci blood-pressure instrument with a von Recklinghausen cuff for the upper arm. The pressure in the cuff was increased above the previously measured maximum blood pressure by blowing up the cuff with an oxygen bomb. The time measurement was begun at the moment the rising mercury column passed the maximum pressure. The ice reaction was determined by laying a piece of ice 10 by 6 cm. in size on the upper arm and observing the finger capillaries of that hand.

In normal persons at ordinary room temperature the duration of the capillary current is thirty seconds. A longer continuation of the flow is caused by equalization in the pressure in the arterial and venous systems. At a colder temperature the time of flow is shortened by increased tonus and contraction of the vessels. At a higher temperature it is increased by dilatation and relaxation of the vessels and there is a back-flow of the blood from the venous limbs of the capillaries into the arterial limbs. In the ice reaction the time is shortened at first, but after the passing of the reaction (four or five minutes) it is lengthened.

In acrocyanosis and arteriosclerosis with moderate hypertonicity the time is shortened to an average of fifteen seconds and there is no back-flow. In pure arteriosclerosis without hypertonicity and in insufficiency of the circulation it is shortened to an average of twelve seconds. In the first form of arteriosclerosis the shortening is due to a contraction of the smaller arteries and their lessened ductility while the back-flow is caused by the decrease in the amount of fluid and in the tonus. In insufficiency of the circulation the cause of the decrease in time is the decrease in the filling of the arteries and the increase in the filling of the veins. Back-flow results from low arterial tonus and increased venous pressure.

In benign nephrosclerosis with marked hypertension there is lengthening of the time of flow as a

result of the marked difference in pressure between the arteries and veins. Back-flow may take place on account of the high tonus. STAHL (Z).

McGlannan, A.: The Effect of Surgical Operations on the Blood Pressure. *South. M. J.*, 1921, xiv, 214.

The author reviewed 1,000 operative cases, noting the various factors which seemed to affect the blood pressure. The operations were performed for hernia, acute appendicitis, gland excisions, cancer of the breast, amputations, osteomyelitis, acute intestinal obstruction, exophthalmic and toxic goiter, intracranial hemorrhage, and tumors.

Simple herniotomy performed on patients between 17 and 35 years and under nitrous oxide and oxygen anaesthesia with novocaine infiltration was accompanied by a primary rise in blood pressure which with few exceptions was maintained throughout the operation. When the anaesthesia was induced with ether a fall in blood pressure occurred more frequently than a primary rise, and in no case was a primary rise sustained throughout the operation. Local anaesthesia alone had no particular effect. During manipulation of the hernial sac the proportion of ether anaesthetized patients who showed a fall in blood pressure was much greater than that of patients anaesthetized with nitrous oxide and novocaine. When novocaine was used alone the pressure tended to remain unchanged or was slightly lowered.

When the anaesthesia was induced with gas the primary rise was not so marked in patients 45 to 70 years old as in younger patients. The primary rise was not as well sustained and on several occasions when the anaesthesia was discontinued the pressure fell to an alarming degree. Excision of the sac caused a fall in pressure to about the same degree as in younger patients.

The conclusions drawn regarding operations for acute appendicitis are about the same as those for operations for hernia. Under various anaesthetics manipulation and traction on the peritoneum and mesentery produced in general a marked drop in the blood pressure.

In operations for cancer of the breast a fall in the blood pressure was noted regularly and was most marked after thorough dissection or the use of the cautery.

Practically all bone operations, whether they were operations for the manipulation of fragments, open operations for fractures, excisions of bone tumors, or amputations, caused a marked drop in the blood pressure.

In thyroidectomies for exophthalmic goiter the pressure showed wide variations in some cases, but as a rule was a fairly constant. On the other hand, in operations for toxic adenomata considerable sensitiveness to the manipulations was noted. The author was unable to make out any great difference between the behavior of toxic patients under anoci-association and that of patients under well-administered ether anaesthesia.

A persistent gradual fall in blood pressure with a simultaneous rise in the pulse rate is the usual observation in shock. As the condition becomes established, the pulse curve and the pressure curve will be seen to cross over one another. During operation it is difficult to separate the phenomena due to hemorrhage from those of shock. This distinction becomes an impossibility if we admit hemorrhage as a factor in the production of shock. The quantity of blood lost seems of less importance here than the manner in which it is lost. Slow oozing of considerable blood is compensated for by some mechanism not available when there is a sudden spurt of a much smaller quantity from a cut artery.

The author advises against changing the patient's position suddenly as such change frequently adds to the severity of the symptoms and may become the determining factor between recovery and death. For this reason the patient should be treated in the operating room on the table until a rally occurs.

When the heart is in good condition and the vessels are sound, careful haemostasis, gentle manipulation, nerve blocking, and the use of nitrous oxide anaesthesia make it possible to perform an operation of long duration without shock. L. D. SNORF.

Bowcock, H. M.: Serious Reactions to Repeated Transfusions in Pernicious Anæmia. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 83.

In certain cases of pernicious anæmia in which repeated transfusions have been given, transfusion becomes self limited because of the inadequacy of the methods for selecting suitable donors. This difficulty having been discovered, no attempt should be made to give a further transfusion in such cases.

The severe reaction is probably due to an anaphylactic manifestation rather than to haemolysis.

Blood matching should be carried out with the greatest care. Whenever possible, the incubation period should be two hours in length or longer.

Blood serum free from cellular elements may produce bone-marrow stimulation.

Members of Group 4 cannot be regarded as suitable donors in every case.

SAMUEL KAHN.

BLOOD AND LYMPH VESSELS

Sorrentino, F.: A Further Contribution to Vascular Surgery (Ulteriore contributo alla chirurgia vasale). *Rassegna internaz. di clin. e terap.*, 1921, ii, 19.

In a case of stab wound with intense hemorrhage in which the external carotid was injured the author ligated the left common carotid. Severe cerebral disturbances were manifested immediately after the operation—facial paralysis, respiratory changes, vomiting, and loss of consciousness for twenty-four hours. Three days later motor aphasia developed and continued for ten days. The disturbances then gradually diminished and finally

disappeared. To date the author has never observed any permanent abnormal developments after ligation of the artery alone. Neither were cerebral disturbances noted in 6 cases of simultaneous ligation of the common carotid artery and the jugular vein previously reported.

W. A. BRENNAN.

Marshall, C. J.: Reconstructive Aneurismorrhaphy in the Third Part of the Axillary Artery. *Brit. M. J.*, 1921, i, 379.

The author presents a case of aneurism of the axillary artery, the result of a gunshot wound received two years previously. The patient was operated on for a pulsating tumor, impaired sensation of the ends of the index and middle fingers, and weakness of flexion in the index finger.

The aneurism and a portion of the axillary artery both above and below were dissected free and Crile artery clamps were applied above and below the tumor. The aneurismal sac was then defined up to its point of origin from the artery and opened by a longitudinal incision. At the junction of vessel and sac was a ring of almost cartilaginous density. Profuse bleeding from the collateral supply made necessary the application of several clamps.

The sac was cut away so that only a thin rim around the neck was left. With a non-cutting fine needle a continuous suture was introduced, beginning above and finishing below the opening and passing through the arterial wall immediately adjoining the thick ring. Mattress sutures of fine silk were used. A second stronger silk suture was then introduced, the needle traversing the artery wall on either side and returning similarly through the rim of the sac, thus embracing the hard ring and securing apposition of its opposite side. Removal of the clamps revealed no oozing. A fascia lata graft was fixed as a collar about the vessel to diminish the strain on the suture line. Both radial pulses were equal at the end of the operation.

Three months later there was no sign of yielding and the brachial pulses remained equal.

A. C. JOHNSON.

Bell, G.: Wounds of the Common Femoral Artery. *Med. J. Australia*, 1921, i, 189.

In wounds of the common femoral artery large hæmatomata may mask the various portions of the femoral and external iliac vessels and render the exact pre-operative localization of the lesion difficult, if not impossible. No permanent ligature should be placed on a main vessel or important branch until the exact site of the vascular lesion is found.

The wound of the vessel may be treated by suture, temporary maintenance of the circulation through a tube coated with paraffin (such as that of Tuffier), or ligation. As a general rule ligation with complete division of the artery to allow retraction of the divided ends is the method of choice.

Transfusion may be indicated. The author reports one case with recovery.

C. R. STEINKE.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Atwell, W. A.: An Anatomical Consideration of the Hypophysis Cerebri. *N. York M. J.*, 1921, cxiii, 366.

The hypophysis arises from neural and oral parts. That portion of it which is of oral origin is divided by the cleft into the pars intermedia and the anterior lobe.

The anterior lobe is derived from the epithelium of the mouth, and the posterior lobe from the brain wall.

Recently a third epithelial lobe extending forward from under the infundibulum toward the optic chiasm has been recognized. Mueller and Mihalcovics called it the anterior process; Joris, the lobus bifurcatus; and Tilney, the pars tuberalis because of the close relationship between it and the tuber cinereum.

The oral evagination known as Rathke's pocket, from which the anterior lobe and pars intermedia of the hypophysis are derived, arises just anterior to the pharyngeal membrane and pushes upward to meet an evagination of the brain wall, the primary infundibulum. Fragments of the epithelial stalk persisting below the sphenoid constitute the pharyngeal hypophysis. Remains of the stalk in the sella turcica, with the hypophysis but separate from it, constitute the parahypophysis.

The cells of the anterior lobe proper are acidophiles and basophiles.

Two kinds of cells occur in the pars intermedia: (1) cells related to the colloid-containing vesicles and evidently the secretory source of the colloid; (2) the secretory cells which are the characteristic elements of the pars intermedia and have been described vaguely hitherto as finely granular, basophile, or neutrophile. "The cells of the second type constitute the conspicuous element of this division of the gland, enabling one to demarcate with perfect safety the limits of the physiological unit providing the technical handling of the material is adequate to preserve the secretory antecedents in the cell. This material is highly labile and disappears rapidly from the cell after death." These cells are polygonal in shape and larger than the colloid-producing cells. The nucleus is eccentric in position and the cytoplasm contains mitochondria gathered into a mass about the size of the nucleus.

The pars tuberalis is made up of cell masses with occasional small and relatively thick-walled acini. The cells are basophilic and have scanty cytoplasm.

The neural lobe is composed almost entirely of neuroglia cells and fibers. Cell nests, single cells, and colloid droplets or hyaline bodies are frequently to be found in the neural lobe and apparently are derived from the pars intermedia. Normally present to some extent, the colloid material is considerably increased in amount following severance of the neural stalk (Cushing). Thus the pars intermedia and the neural lobe form a structural complex to which the

term "posterior lobe" as used in its physiological sense is applied.

In a general way the functions of the two principal divisions of the pituitary are fairly well differentiated. Certain disturbances of skeletal growth and genital development are ascribed to altered function of the anterior lobe proper. To the posterior lobe is ascribed control of metabolism, especially as regards the utilization of carbohydrates and, according to some authors, the basal metabolic rate. Disturbances of this lobe influence the secretion of urine and the tonus and contraction of smooth muscle.

M. H. KAHN.

Murphy, Hussey, Sturm, and Nakahara: The Effect of Induced Cellular Reaction on the Fate of Cancer Grafts. IV. Studies on Lymphoid Activity. *J. Exper. M.*, 1921, xxxiii, 315.

The authors have previously shown that the induction of a general lymphocytosis is accompanied by a more or less marked immunity to cancer, and that a local reaction of lymphoid cells induced in the skin by means of the X-rays renders this tissue unsuitable for the growth of cancer. The reaction about a cancer graft inoculated into a mouse previously injected with homologous living tissue strikingly resembles a local anaphylactic reaction and is followed by more or less complete destruction of the tumor graft. The authors concluded that if the cellular reaction is an important factor in immunity it should be possible to bring about a local immunity to cancer by inducing around a graft a reaction similar to that which occurs in a generally immune animal. As the local anaphylactic reaction resembles the local effect observed about a graft in cancer-immune animals, they tested out the influence of the former reaction on cancer grafts.

The experiments offered further evidence of the hypothesis that the so-called immunity to the transplanted cancers of mice depends on a local cellular reaction in which cells of the lymphoid type play the principal part. The usual method of producing the immunity was the injection of a quantity of living homologous tissue. This led to a non-specific immunity which in turn was directed against a great variety of cancers and sarcomata as well as against transplanted normal tissue.

It was suggested that this immunity phenomenon is analogous to the so-called anaphylactic reaction, but the exact nature of the relation has never been demonstrated. The experiments reported here indicated that the relationship is very close. The first injection prepared or sensitized, and the second injection of the cancer cells called out a cellular exudate such as was observed in local anaphylactic reactions. It was unmistakable that the condition of local anaphylaxis rendered the tissues affected unsuitable for the growth of a cancer-graft, and the histologic changes which arose corresponded to those seen about a cancer graft in an animal immunized by a previous injection of homologous tissue.

That the cellular exudate was the essential inhibiting agent was indicated by the fact that when this exudate was prevented from arising or was arrested the protective effect was either annulled or materially reduced. It was not determined whether the desensitization induced by X-ray exposure resulted in such a general destruction of the lymphocytes that the number remaining was insufficient to yield the local reaction or whether some other factor was responsible. In brief, there seemed to be no other explanation for the results recorded than that cells of the lymphoid type are capable of preventing the growth of a transplanted cancer when present locally in sufficient numbers. Hence the authors concluded that these cells are an active agent in bringing about the so-called immunity condition to transplanted cancer. They give a short summary of their findings as follows:

Mice sensitized by an injection of 0.2 c. cm. of rat blood and 10 days later inoculated with a mixture of rat blood and a transplantable mouse cancer showed a high degree of immunity to the cancer growth, while mice sensitized in the same manner and inoculated with cancer graft with no rat blood showed no immunity. Likewise, non-sensitized mice inoculated with a mixture of rat blood and cancer cells showed no immunity.

Mice sensitized to rat blood and then given a series of doses of X-ray treatment between the time of this injection and the inoculation of the cancer-rat blood mixture showed a suppression of the factors affording protection as the cancers grew as well in these animals as in the controls.

In mice sensitized with rat blood and ten days later inoculated with a cancer-rat blood mixture the cells were destroyed by a local dose of X-rays twenty hours after the inoculation when the cellular exudation was at its height. The degree of immunity was reduced and the cancers grew almost as well as in the controls.

G. E. BEILBY.

Nakahara, W., and Murphy, J. B.: The Lymphocyte in Natural and Induced Resistance to Transplanted Cancer. VI. Histologic Comparison of the Lymphoid Tissue of Naturally Immune and Susceptible Mice. *J. Exper. M.*, 1921, xxxiii, 327.

It has long been known that if a number of normal white mice were inoculated with fragments of transplantable mouse cancer, some of them would prove to be naturally refractory. The striking histologic difference in the reaction about cancer grafts in naturally resistant and in susceptible animals is well known. Murphy and Morton showed that the resistant state is associated with a marked lymphocytosis in the blood which is absent in the susceptible animals, and that treatment of normal animals with X-rays destructive to lymphocytes removed at the same time the immunity otherwise present. Hence the conclusion was drawn that the lymphocyte is a factor in the state of natural immunity.

Histologic studies paralleling the authors' observations on the circulating lymphocytes indicated that the lymphoid tissue is the basis of the immunity to transplanted cancer induced by intense dry heat, small doses of low penetrating X-rays, and the injection of homologous living cells. Hence it appeared that a histologic comparison of lymphoid organs of mice naturally immune and naturally susceptible to transplanted cancer might give enlightening results, and it was with this end in view that the study reported was undertaken.

Preliminary experiments indicated that soon after cancer inoculation more or less definite histologic changes took place in lymphoid organs, especially in the spleen. These changes, though not extensive, were nevertheless of a characteristic nature and therefore it was not difficult to determine at the end of the third week of the experiment whether a given spleen came from an immune or a susceptible mouse. Accordingly studies were made of the lymphoid organs of young white adult mice inoculated with a given strain of tumor (Bashford adenocarcinoma No. 63) and killed three weeks later. The tissues were fixed in Carnoy's 6-3-1 and stained with eosin-methylene blue, Ehrlich's hæmatoxylin and eosin, or Heidenhain's iron-hæmatoxylin. The material consisted of the spleen and lymph nodes from 105 mice, of which 29 were immune to the inoculated cancer and the remaining 76 had tumors.

In immune mice there were more or less marked indications of lymphoid hyperplasia, whereas in susceptible mice a lymphoid depletion in varying degree tended to arise. The former condition resembled greatly the histologic picture described in animals in which artificial lymphoid stimulation was induced. The extreme cases of the susceptible type resembled in their general nature the condition induced by a large dose of X-rays although the cellular destruction was far less extensive; the effect was more like that seen after a long exposure to X-rays of low penetration.

These findings were in entire agreement with the results of previous experiments in which the importance of the part played by the lymphocytes in artificial resistance to transplanted cancer in mice was indicated. They agreed also with the observations of Mottram and Russ who showed that the spleens of rats resistant to the Jensen rat sarcoma tended to show a higher lymphocyte content than those of normal animals.

G. E. BEILBY.

ROENTGENOLOGY AND RADIUM THERAPY

Power, H. D.: Stereoscopic Roentgenography: The Visualization of Surfaces for the Better Localization of Underlying Foreign Bodies. *J. Am. M. Ass.*, 1921, lxxvi, 645.

The use of stereoscopic roentgenography has become commonplace and would be still greater but for the difficulty in examining the plates. The author believes that for most purposes large plates and the reflecting stereoscope are entirely

unnecessary. Most conditions requiring examination in this way can be included within the dimensions of a 3 by 4 in. plate, and two such plates taken under a tube with a difference of $2\frac{1}{2}$ in. from their centers can be examined in an ordinary stereoscope. In most cases in which this is done the area to be examined stereoscopically is determined first by means of the fluoroscope or a single exposure on a large plate.

In the localization of foreign bodies by stereoscopic roentgenograms the results have been somewhat unreliable as it has been found rather difficult to judge the relative distances involved. The use of metallic skin markers has not always been successful, and inunction of the skin surface with petrolatum and salts of bismuth or barium has not proved entirely satisfactory. The author has found that flake white No. 2 in oil makes the finest details of the skin visible roentgenographically. In order to render its removal less difficult, he mixes the flake white with paraffin which he applies when melted and afterwards removes as a solid shell. This mixture does not give the same fineness of detail as the simple paint, but may be applied without difficulty over small areas and yields the same frontal point of view for the comparison of distance.

Besides providing a better basis for judgment of the position of foreign bodies, the procedure described has a field in determining the direction of anal and other fistulæ and in the visualization of the eyelid for the better localization of small foreign bodies in the eye. Doubtless other uses also will suggest themselves.

ADOLPH HARTUNG.

Lynah, H. L., and Stewart, W. H.: Roentgenographic Studies of Bronchiectasis and Lung Abscess after Direct Injection of Bismuth Mixture Through the Bronchoscope. *Am. J. Roentgenol.*, 1921, n.s. viii, 49.

The fact that the accidental entry of bismuth paste into the trachea and lower bronchi during an examination of an œsophageal obstruction did not have any harmful results suggested to Stewart that opaque substances might be injected into the lung through the bronchoscope with safety. More recently he observed that in patients with an empyemic cavity communicating directly with a branch bronchus through a pleuropulmonary fistula injected bismuth mixtures permeated many of the bronchial branches and later were expectorated without causing serious disturbance.

So far as the authors are able to ascertain, it was not until early in 1920 that successful efforts were made to outline lung cavities roentgenographically after the injection of opaque substances through the bronchoscope. In May, 1920, Lynah of New York reported two cases of lung abscess which had been successfully mapped out roentgenographically following the bronchoscopic injection of aqueous and oily mixtures of bismuth subcarbonate into the area of diseased lung. Both of these patients have since been examined repeatedly by the authors.

These two cases, one case of lung abscess, and two cases of bronchiectasis are reported in this article in detail and illustrated with roentgenograms. The authors draw the following conclusions:

1. Bismuth mixtures may be injected into the bronchi and lungs of a living patient without danger.

2. The injection of an opaque substance into the lung of the living patient will prove of great value in the study of cough, the expulsion of substances from the lung, and lung drainage. It will aid also in localizing bronchial strictures and will be of the greatest value to the surgeon in mapping out an abscess cavity in the lobe of the lung.

3. A definite lung abscess cavity is seldom seen bronchoscopically. Pus is usually observed coming from a branch bronchus even when the abscess is not in that portion of the lung from which the pus is oozing. An injection of bismuth mixture or some other opaque mixture will clear up this condition.

4. When bismuth enters the abscess cavity it is recognized by its metallic luster, whereas in the lobular lung structure it is discerned as a dull opaque area. Like bismuth, pus diffuses and soaks the lobular structure and thus often makes the involved area appear many times larger than it really is.

5. The bismuth mixture injected in the cases reported consisted of 8 c.cm. of bismuth subcarbonate in pure olive oil (1:2). Before it is injected the mixture should be rendered sterile by boiling.

6. The injection should be made slowly. If it is made with a squirt the roentgenographic observations may be spoiled by the soaking of the lung structure surrounding the diseased area with the bismuth.

7. From the preliminary studies reported it seems that cough and the action of cilia are not the only means by which secretions are expelled.

8. While in the cases reported the bismuth mixtures were originally injected for the purpose of lung mapping in cases of cavities due to lung abscess, they seem to have been of therapeutic benefit and so far the procedure has done no harm.

9. The fluoroscopic examination is important, but the stereoroentgenographic examination is the best means of localizing cavities.

10. Experience has shown that the roentgen examination should be made almost immediately after the removal of the bronchoscope; otherwise the patient will remove much of the bismuth from the involved lung by coughing. ADOLPH HARTUNG.

Tyler, A. F.: Pneumoperitoneum as an Aid in the Diagnosis of Diseases of the Left Half of the Abdomen. *Am. J. Roentgenol.*, 1921, n.s. viii, 65.

When the author is unable definitely to locate pathology in the left half of the abdomen by the usual physical examination and the opaque meal examination of the gastro-intestinal tract, he employs pneumoperitoneum as a further method of investigation. In reviewing his experience he has found that the cases in which it has been most definitely helpful were those with some pathologic

condition on the left side. He therefore briefly reviews the anatomy of the left half of the abdomen in relation to the findings demonstrable by pneumoperitoneum.

The method has proved itself of great value in the differentiation of kidney stones from calcareous mesenteric glands, especially when catheterization of the ureter is impossible. Hydronephrosis and new growths involving the kidney or retroperitoneal space can be readily demonstrated. Different types of enlarged spleen may be revealed by pneumoperitoneum, but must be differentiated by the complete blood count and laboratory methods. Pneumoperitoneum demonstrates cysts of the pancreas better than any other method. It also shows adhesions to the various organs and thus clears up many obscure cases.

Detailed histories of cases of enlarged left kidney, perisplenic adhesions, perigastric adhesions, abdominal adhesions, adhesions to the colon, fibroid tumor of the uterus associated with pregnancy, ureteral stone, bladder stones, adhesive peritonitis with ascites, and fluid in the peritoneal cavity without adhesions are given. ADOLPH HARTUNG.

Sante, L. R.: The Detection of Retroperitoneal Masses by the Aid of Pneumoperitoneum. *Am. J. Roentgenol.*, 1921, n. s. viii, 129.

In a case presenting a slightly tender, very hard, smooth mass in the lower right quadrant of the abdomen, a pneumoperitoneum examination made with the patient prone enabled the author to determine that the mass was located retroperitoneally and was completely separated from the kidneys. Associated destruction of the lumbar spine led to a diagnosis of psoas abscess. This diagnosis was confirmed by subsequent developments.

As the patient's prone position demonstrated the retroperitoneal origin of the tumor mass so clearly in this instance, a closer study of its possibilities in other cases was made. Consideration of the anatomical arrangement in this position illustrated its value. It was noted that if the patient were suspended on two blocks, so as to remove all pressure from the abdomen, the belly wall sagged down and all of the intra-abdominal organs with their mesenteric attachments fell forward, leaving a clear space between them and the retroperitoneal structures. The liver, being attached by the triangular ligament to the diaphragm, dropped forward also to a greater or lesser extent in different persons according to the location of this attachment, and formed a triangular shadow with the apex at the diaphragmatic attachment. If the patient's condition was normal this space was clear; if a retroperitoneal mass was present, it was encroached upon.

Examinations made in the manner described proved of great value in the diagnosis of two cases of new growth involving the left kidney and a case of perinephritic abscess. The author gives a detailed account of these cases and the roentgen findings. When the pathologic process is low down so that

the shadow of the mass falls below the shadow of the innominate bones, the patient, still in dorsal suspension, must be rotated slightly toward the side of the tumor in order that a view unobstructed by the crest of the ilium may be obtained. A case of retroperitoneal carcinoma secondary to a carcinoma of the bladder was diagnosed in this manner.

To make a satisfactory retroperitoneal examination by means of pneumoperitoneum it is essential:

1. That the bowels be well cleaned out with vegetable cathartics.
2. That the patient void his urine just before the examination.
3. That little, if any, food be given just prior to the examination.
4. That the abdomen be overdistended with the inflating medium.
5. That the patient be well supported so that no pressure will be exerted on the intra-abdominal contents.

ADOLPH HARTUNG.

Johnson, H. M.: The X-Ray in the Diagnosis of Prostatism. *Surg., Gynec. & Obst.*, 1921, xxxii, 179.

The term "prostatism" is applied to urinary difficulties of men caused by obstruction at the bladder neck due to glandular enlargement of the prostate, fibrous changes within it, or coarctation of the internal orifice of the bladder.

The methods commonly used to diagnose these conditions may not give all the desired information or it may be impossible or inexpedient to employ all of them. The author has found the routine use of the roentgen ray of great value. The following technique is employed:

Three roentgen exposures are made. Plate 1 is made with the bladder empty; Plate 2, with the bladder filled with room air; and Plate 3, with the bladder filled with 10 per cent sodium iodide or bromide solution. The purpose of making Plate 1 is to locate calculi in the prostate, to discover free or encysted calculi in the bladder, and to outline any gas which may be present in the bowel and confuse the reading of Plate 2. Plate 2 outlines the enlarged prostate and other tumefactions, while Plate 3 outlines diverticula and shows the size and shape of the bladder and the presence of saccules or dilated ureters.

The author does not advocate the use of the method described to the exclusion of other methods now in use, such as cystoscopy, but recommends it as an adjunct to the others. He believes that some of the unsatisfactory results following prostatectomy will be eliminated by the regular employment of the X-ray.

ADOLPH HARTUNG.

Forssell, G.: A Few Notes on the Diagnosis and Differential Diagnosis of Tuberculosis in Bones and Joints. *Arch. Radiol. & Electrotherapy*, 1921, xxv, 247, 293.

The object of this article is to give a short résumé of the distinctive features which, from experience,

may be regarded as typical in the roentgen picture of tuberculosis in bones and joints, and to emphasize the most important diagnostic possibilities, the sources of error and the difficulties which are commonly encountered in the differential diagnosis.

It is essential, if a tuberculous lesion of a bone or joint is to be seen in the roentgenogram, that the change of relative density be sufficient to permit its recognition as a deviation from the normal. If it is not sufficiently advanced, as is frequently the case in early tuberculosis, it will not be seen in the roentgenogram. A lesion which on one occasion may give no roentgen evidence of its presence may often after only a short interval yield appearances which are more or less diagnostic.

A number of cases of typical bone and joint tuberculosis are described minutely as regards the roentgen findings and are illustrated by roentgenograms. The distinctive features in the roentgen examination which guide one's judgment are the localization of the bone foci, principally to the epiphyses, the purely destructive character of the change in the bone in its progressive stages, the usual round shape of the epiphyseal foci, the "vitreous atrophy" due to the reduction of mineral matter in adjacent bones, the reduction of the articular cartilages, the erosion of the bone and cartilaginous surfaces, condensation and thickening of the articular capsule, and the presence of abscess shadows. Each of these symptoms in itself does not, as a rule, constitute a diagnostic sign of tuberculosis, but when they are all taken together and compared with the pictures presented by other forms of disease they will frequently give a decisive verdict with regard to the diagnosis.

The roentgen examination furnishes important evidence also in the differential diagnosis of conditions which may resemble bone and joint tuberculosis clinically. Koehler's disease of the tarsus is distinguished by a displacement of the mineral matter in the scaphoid to the center of the bone where it produces a lamellar formation composed of smaller laminae or islands of tissue more abundant in lime salts. It differs in the roentgen plate from the usual picture of tuberculosis in that the cartilaginous body of the scaphoid is preserved so that the distance from the proximal surface of the first cuneiform to the head of the astragalus is normal; consequently the general decrease in density of the tarsus is lacking. Moreover, the scaphoid, in spite of the great changes, develops to normal size, form, and structure in the course of a few years.

Perthes' or Legg's disease reveals itself by a cleavage of the center of ossification of the head of the femur into several irregularly shaped dense parts with light intervals, and by a flattening and pressing out of the epiphysis and loosening of the upper bone surface on the neck. Schlatter's disease of the tibial apophysis shows cleavage of the epiphyseal nucleus and especially a spotty or "fluffy" appearance of the nucleus fragments. In other respects the knee joint appears normal. In osteochondritis dissecans there is a defect in one of

the condyles of the femur around which is a dense zone. The rest of the bone structure and mineral matter is well preserved in spite of the injury to the bone and cartilage; the upper limits of the articular cartilage are preserved and the articular capsule is clear and transparent.

A chronic traumatic arthritis rarely presents bone decalcification, and the thickness of the articular cartilage is preserved. In septic osteomyelitis there is, in addition to the destructive and atrophic process, evidence of new bone formation from the periosteum. Ricket's and Barlow's disease present, as a rule, unmistakable roentgen pictures.

Syphilis may produce changes in bone very similar to those of tuberculosis. A typical roentgen picture of gummatous osteoperiostitis with thick and dense periosteal bone formation, together with gummatous bone destruction, is characteristic. Hereditary syphilitic osteochondritis and periostitis present an uneven zone of condensation in the primary layer of cartilaginous ossification, the surface being toward the diaphyseal as well as the epiphyseal surface, a decalcified granular layer in the diaphyseal extremity, and a cuff-like periosteal bone formation around the diaphyseal extremities. At this stage there is little chance for a mistake in the diagnosis, but later on, when the osteochondritis disappears and only or chiefly the periosteal hood remains, confusion with the picture of tuberculous spina ventosa is not impossible.

Gout may cause great destruction of bone. Typically, however, it shows blister-like gaps in the outlines of the cancellous tissue and clear outlines of the surrounding bone. Traumatism of joints may subsequently give symptoms resembling those of tuberculosis but a careful roentgen examination will readily clear the diagnosis. Tumors of bone can usually be differentiated roentgenographically from tuberculosis by their sharp limitation, the expansion of the bone, and the absence of surrounding decalcification.

In conclusion, the author states that the roentgen examination can give valuable aid in the direct and differential diagnosis of bone and joint tuberculosis. Fallacies of diagnosis based on the roentgenogram are due to faulty interpretation of the findings which in themselves are accurate and infallible. Perfection of technique, experience, good judgment, and minute study of the roentgenogram are essential if mistakes are to be avoided.

ADOLPH HARTUNG.

Pacini, A. J.: A Concept of X-Ray Pathology. V. Osteopathy. *Med. Rec.*, 1921, xcix, 218.

In the study of the X-ray pathology of bone there are six structures of interest to the roentgenologist: (1) bone tissue, (2) marrow, (3) periosteum, (4) cartilage, (5) synovia, and (6) ligament. The author gives a brief description of each.

In dealing with bones it is ever to be remembered that the morbid process runs its course in the marrow, locked up in the firm rigid casing or shell. The

effects of the disease are rendered manifest upon this shell, but the changes in the shell must not be regarded as the disease itself. In children the epiphyseal cartilage may influence the spread of the condition.

Osteopathies may be subdivided into the following groups: (1) congenital osteopathies; (2) degenerative, toxic, and endocrinopathic osteopathies; (3) osteopathies of circulatory origin; (4) inflammatory osteopathies; (5) neuropathic osteopathies; (6) parasitic osteopathies; and (7) neoplastic osteopathies.

Congenital osteopathy. The congenital absence of bone is immediately recognized in the X-ray picture. When there is a variation of more than one spinal element there is usually a tendency to visceroptosis. Visceroptosis is more apt to be present when there are four lumbar vertebrae than when there are five. There is but one positive method of determining the presence of cervical ribs, i.e., an X-ray examination of the entire spinal column. This is necessary especially when the cervical ribs are double.

Degenerative, toxic, and endocrinopathic osteopathies. When the nutrition of a bony part is impaired, the changes indicating the deviation from the normal are associated with variations in the radiopacity of the bone. Radiolucency is observed as a result of mineral absorption. The changes causing radiolucency occur much earlier and more quickly than those which induce radiopacity.

If a muscle or a part is kept at rest for any considerable length of time, the bones in that part lose some of their calcium. The mineral is absorbed by the marrow where it comes in contact with the bone. The bone assumes a more marked porosity, a condition known as "osteoporosis."

Rickets is a common disease among young infants. It is characterized by a definite change in the epiphyseal line but not in the joint surface proper. The radiolucency may become so extreme as to make it difficult to distinguish between the affected rachitic bone and the surrounding soft tissue.

Periostitis may occur in rickets but is not common. In rickets a radiolucent band in the lung may sometimes be observed on either side of, and just beyond, the shadow of the heart and aorta. This is pathognomonic of rickets and due to direct pressure of the expanded ribs on the lung surface producing a line of atelectasis.

The X-ray pathology of rickets is manifested by halisteresis conducive to bone radiolucency, periarticular swelling, changes at the epiphyseal line producing mushroom flarings, fragility leading to fractures, occasional periostitis, the atelectatic pulmonary band, and the rachitic rosary.

The X-ray pathology of scurvy centers in and around the joint. A white line just back of the epiphysis in the shaft margin is the earliest evidence of the presence of scurvy.

Inflammatory osteopathies. From the viewpoint of X-ray pathology there are two types of inflamma-

tion: that due to the usual organisms, including staphylococci, and that due to organisms such as the typhoid bacillus and pneumococcus which produce changes in the marrow impossible to differentiate from those produced by pyogenic organisms. There are also the inflammatory reactions due to invasion by syphilis or tuberculosis which produces a somewhat distinctive X-ray pathology and is called clinically "specific inflammation."

The common sites of osteomyelitis are the shaft of the femur, the clavicle, scapula, the ribs, and the tibiae. This is the order of frequency when the infection is primarily of hæmatogenous origin, but any bone in the body may become involved. It is seldom that acute osteomyelitis is diagnosed from the X-ray plate unless it has reached the stage of abscess formation or a considerable area of bone has been attacked. Periosteum is never visualized on an X-ray plate unless it has undergone a change associated with infiltration of radiopaque or radiolucent material, generally calcium salts.

The X-ray signs of chronic osteomyelitic involvement are general enlargement of the bone, a more radiopaque structure, and a tendency to complete obliteration of the medullary canal.

In chronic periostitis the X-ray picture shows a periosteal radiolucent or radiopaque mantle surrounding the shaft, but less radiopaque than the shaft. When of luetic origin, periostitis may assume its usual form, but occasionally the deposit of lime salts in the periosteal tissue is irregular and unevenly distributed. The result is a "lace-like" appearance of the elevated periosteum. This lace-like periosteal reaction, serrated or tooth-like, is so typical of syphilis that it is practically an infallible X-ray sign of syphilis.

In chronic pulmonary periosteopathies the X-ray pathology is that of a radiopaque hair-line elevation separated from the bone by a markedly radioparent space. The X-ray appearance is difficult to differentiate from that of acute or subacute periostitis of a virulent infection in the initial stages.

According to the X-ray findings, syphilis manifested in children is generally congenital, while that manifested in adults is usually acquired. Acquired bone syphilis is rarely, if ever, found in children. Syphilis is a stimulant to mineral deposition. The deposit of lime salts is shown in the X-ray picture by the marked infiltration of calcium in the periosteum.

In secondary syphilis superperiosteal deposits of mineral giving rise to syphilitic nodes become clinically palpable and are readily visualized in the X-ray examination.

In tertiary syphilis gummata appear. These may be either in the form of a circumscribed periostitis, causing the formation of round nodes, or may begin in the marrow and the spongy part of the long bones. Occasionally a phalanx may be affected as in dactylitis syphilitica, or a metacarpal bone may suffer luetic invasion giving rise to an appearance resembling that of a tuberculous "spina ventosa."

In bone, the presence of a tubercular focus manifests itself chiefly by a markedly increased radioparency of the structure. The claim is made that it requires nine months for tuberculosis to develop changes sufficiently definite to be recognized in the X-ray picture.

In Paget's disease the X-ray pathology is manifested by longitudinal areas of radioparency.

Neuropathic osteopathies. The changes affecting a joint in cases of syringomyelia are difficult to distinguish by means of the X-ray from Charcot joint. In the Charcot joint, however, there is more bone destruction and more detritus than in syringomyelia.

Raynaud's disease and leprosy give a pointing of distal phalanges. Raynaud's disease usually fails to show any signs until it has gone on to gangrene.

In parasitic osteopathies the X-ray pathology is that of a bone cavity.

Chondromata have a characteristic X-ray appearance. When pure, they show as hyaline radiolucent areas in distinct contrast to the surrounding bone and entirely devoid of structure.

Bone tumors, when typical, are easily recognized in the X-ray plate. Malignancy of a growth is established if invasion can be demonstrated by the X-ray. Invasion is the destructive progression of a new growth characterized by the complete replacement of all tissue in its path.

It is difficult to differentiate between carcinoma and sarcoma by means of the X-ray. The site and the patient's age may suggest the probable character of the tumor.

M. I. MALONEY.

Pacini, A. J.: A Concept of X-Ray Pathology. VI. Arthropathy. *Med. Rec.*, 1921, xcix, 259.

In this consideration of arthropathies from the roentgen standpoint emphasis is laid first upon the two-fold technology involved in making roentgenograms of joints. First, the exposure should be such as to permit the visualization of the bone surfaces just outside the joint in order that their relative relation may be determined. Second, an entirely different set of exposures should be made to show the soft parts which surround and involve the joint. When an exposure is made in this manner the changes in cartilage, particularly those involving early infiltration of calcium salts into the cartilaginous fibers, the early villous proliferation of the synovia, and incipient clouding of the joint fluid may be recognized.

In a normal joint four entities concern the roentgenologist: cartilage, synovia, ligament, and fluid. The author discusses their radiability and appearance and the changes they undergo in disease in detail.

Arthropathies are classified as: (1) congenital; (2) static and toxic degenerative; (3) those of circulatory origin; (4) inflammatory arthropathies; and (5) neuropathies. In discussing Class 1 the author directs attention especially to congenital dislocation of the hip. Class 2 includes conditions in which

changes secondary to changes in nearby joints are noted. In this class belong Goldthwait's villous arthritis, ganglion carpi, lipoma arborescens, sacroiliac subluxation, and arthropathies following the exanthemata such as smallpox, measles, scarlet fever, and rubella. The most important clinical variety of arthropathy of circulatory origin is the bleeder's joint.

Class 4 is divided for the convenience of the roentgenologist into acute and chronic infectious arthritides. The former are subdivided into: (1) traumatic, and (2) infectious, and the latter into: (1) atrophic, and (2) hypertrophic. Loose bodies in joints are discussed at length. The various changes seen in gout, gonorrhoeal, typhoid, pneumococcic, and pyogenic arthritides are described. Generally speaking, the roentgen findings are of less positive value in the acute arthropathies than in the chronic. It is seldom that the exact cause of a very acute arthritis can be determined. The true nature of the pathology may become apparent only after the process is well established and has gone on practically to chronicity.

Of the chronic arthropathies two main types may be differentiated:

1. The type characterized by proliferation of the synovia and marrow with associated atrophy of the bone and cartilage. This includes chronic gonorrhoeal and syphilitic arthritis and tuberculosis.

2. The type characterized by degeneration of the synovia and marrow and hypertrophy of the bone and cartilage. To this subgroup belong cases heretofore described as osteo-arthritis, hypertrophic arthritis, and degenerative arthritis, and such lesions as Heberden's nodes and allied conditions.

A valuable roentgen-ray classification would be one which classifies arthritic conditions into three groups:

1. Subintensive arthritis manifested by swelling and synovial changes. This would include all the arthritides discussed under the acute forms in the classification just given.

2. Atrophic arthritis manifested by changes in the bone density and by cartilage destruction.

3. Hypertrophic arthritis manifested by an increase in the bone content of the joint appearing as exostoses and other evidences of calcium deposits.

The neuropathies of Class 5 include the Charcot joint. In these conditions the most distinctive sign aside from destruction is the absence of atrophy and the presence of eburnation.

ADOLPH HARTUNG.

Murphy, Hussey, Nakahara, and Sturm: Studies on X-Ray Effects. VI. The Effect of the Cellular Reaction Induced by X-Rays on Cancer Grafts. *J. Exper. M.*, 1921, xxxiii, 299.

The theory that cancer tissue in general is more susceptible to injury by the X-rays than normal tissue has been the subject of extensive investigation by the authors, and as far as they have been able to determine from the literature no conclusive proof has been brought forth to substantiate this theory. Undoubtedly cancer cells may be killed by the

X-rays, but experiments show that the X-ray dosage which can be given to man without causing burns and other deleterious effects is not sufficient to kill the cancer cell *in vitro*.

In general the authors believe that in the treatment of human cancer the X-rays have given uniformly beneficial results in only one type of malignant disease, namely, skin cancer, particularly of the basal-cell epithelioma type. Many explanations have been brought forward to account for the fact that these growths are so easily affected while other cancers, lying just beneath the skin, and therefore almost as accessible to the rays, yield less uniform results. It was concluded by X-ray workers that the difference depended on dosage; accordingly they endeavored to increase the amount of X-rays delivered to the diseased area. However, even very large doses of X-rays have failed to give uniformly good results in any but superficial cancers, although sometimes they caused a slowing down of the progress or even a temporary cessation of growth. Actual retrogression rarely occurred. In the vast majority of instances the treatment had no effect, and even in the few cases in which there was improvement the benefit was only temporary.

Aside from skin cancer the only other tumors greatly affected by the X-rays are the sarcomata arising from the testicle and certain lymphoid tumors. It was interesting to the authors to note that the tissues from which these tumors arise are the most sensitive to the X-rays of all normal tissues. Here again it was doubtful whether the malignant tissue was any more sensitive than the normal tissue from which it arose. With regard to the susceptibility of normal and cancer cells to the ray the authors give most attention to the following two theories: (1) the dividing cell has an increased susceptibility to the X-rays, and (2) the effect obtained by X-ray therapy is due to the induced obliteration of the blood vessels which diminishes the nutrition delivered to the new growth.

Studies carried out previous to this investigation and extending over several years emphasized the close relationship between the lymphocytes and resistance or susceptibility to cancer growths. They showed also that the lymphocyte is greatly affected by the X-rays since it was possible either to stimulate the production of these cells by small doses or practically to destroy all the lymphoid tissues of the body by larger doses.

In looking for an explanation of the results of the treatment of cancer in man with the X-rays in the light of these findings the authors noted two interesting observations in the literature; first, that in treating cancer of the skin the method found to be best is the one in which a dose sufficient to produce a so-called X-ray erythema is given, the dose not being repeated until this erythema has subsided; and second, that the so-called X-ray erythema, when studied histologically, consists of a lymphoid infiltration of the skin layers which does not extend to the subcutaneous or deeper tissues in addition to the

dilation of the blood vessels, etc. Hence it seemed not impossible that this important difference might account for the discordant results of the treatment of skin cancers and those of the deeper tissues. A series of experiments were planned to test this point.

It seemed probable to the authors that the cause of the X-ray action in rendering an area unsuitable for cancer growth is the local cellular reaction induced in this tissue. Their experiments covering the point that the beneficial effect of the X-rays depends on the induced blood-vessel changes with a resultant deficiency of nutrition to the tumor cells showed that at no stage of the erythema or later during the retrogression of the tumor was there any evidence of obstruction to the local blood supply. In other cases they found that the apparent retrogression of the nodule was due simply to the destruction of the lymphoid elements of the gland, no effect whatever being exerted on the cancer cells.

The experiments were made on mice. Small areas of the skin in the groin were subjected to an erythema dose of the X-rays and a week later a cancer graft was inoculated intracutaneously into the area and at the same time a similar graft was inoculated in the same manner in the opposite groin which was protected from the X-rays. The grafts in the X-rayed area showed a low percentage of takes, while those in the normal skin gave the usual high percentage. When the graft was introduced into the subcutaneous tissues it grew equally as well in the X-rayed area as in the protected area.

Histologic examination showed that a few days after X-ray treatment the skin layers were markedly infiltrated with round cells of the lymphoid type. The reaction did not extend deeper than the skin layers. The authors suggest that this local lymphoid reaction induced by the X-ray controlled the graft made into the skin, while its absence in deeper tissues accounted for the growth of the grafts more deeply implanted.

G. E. BEILBY.

LEGAL MEDICINE

Association Not Liable for Expenses of Member Sick at Distant Place. *International & Great Northern Ry. Employees' Hospital Association vs. Bell (Texas)*, 224 S. W. R., p. 309.

The International and Great Northern Railway Employees' Hospital Association, as stated in its charter, was formed to provide, under such rules and regulations as might be prescribed by the Board of Trustees of the Association, medical and surgical treatment for those of its members who are injured or disabled by accident or sickness while in the employ of the railway company. Under the construction of the rules, the plaintiff was promised medical treatment only in case of accident or sickness occurring along the line of the road where, according to the evidence, the Association had in its employ about 100 physicians and surgeons to treat its members. If a member were treated by one of these physicians or surgeons elsewhere than in the

Association hospital such treatment could be given only temporarily or if the member was too seriously injured or sick to be removed to the hospital.

The plaintiff was unfortunate in that his sickness befell him where he could not obtain the treatment to which his payment of the Association dues would have entitled him if his sickness had occurred where the facilities for his treatment provided by the Association were available. His misfortune, however, would not justify the extension of the benefits promised him by the Association and the imposition of obligations on the Association beyond the terms of the contract as evidenced by the Association's charter and rules. The court, therefore, held that he was not entitled to recover hospital, medical, or surgical expenses incurred by him during a serious spell of sickness, stated to have been typhoid fever, which befell him in St. Louis while he was performing the duties of his employment by the International and Great Northern Railway Company.

J. A. CASTAGNINO.

Damages Allowed for the Loss of an Eye. *P. Lorillard Co., Inc., vs. Clay (Va.)*, 104 S. E. R., p. 384.

The Supreme Court of Appeals of Virginia reduced a judgment from \$15,000 to \$10,000 as damages for the loss of an eye by an unskilled workman about 21 years of age who had been earning \$14.00 a week before his injury and subsequently returned to his old job at an increase in wages of \$4.00 a week.

There is no rule of law fixing the measure of damages in cases of this kind, and a verdict will not be disturbed unless it appears that it has been influenced by partiality or prejudice. The attendant suffering and the subsequent incapacity to follow a usual calling may be different in different cases. When the facts in a number of cases are substantially the same, however, the compensation to be made therefor ought not to be left wholly indeterminate or wholly dependent on the verdict in a particular case if any means can be discovered by which the amount of the compensation can be reasonably approximated.

In 18 cases arising in 10 different states in which verdicts for the loss of an eye met the approval of the appellate courts the verdicts ranged from \$1,400 to \$15,000, the average of the whole being \$5,424. Many of these cases, however, were decided years ago before the cost of living increased to its present level. This increase is a legitimate item to be taken into account in fixing the compensation to be made for personal injuries.

J. A. CASTAGNINO.

Death of Hospital Employee from Influenza as "Injury." *City and County of San Francisco vs. Industrial Accident Commission et al. (Calif.)*, 191 Pac. R., p. 26.

A hospital steward was taken with influenza, Oct. 15, 1918, and died of that disease eight days later. It was contended that the awarding of compensation under the Workmen's Compensation Act

for a death from disease not caused by a bodily injury suffered through violence was beyond the powers of the Commission under the provision of the State constitution at that time authorizing the legislature to create and enforce a liability on the part of employers to compensate their employees for injury in the course of their employment. However, in view of the fact that the word "injury" has two possible meanings, a broad one and a narrow one, and the fact that the legislature in construing this provision placed on the word the broader meaning, the provision of the Workmen's Compensation Act declaring a disease arising out of employment is an injury for which compensation shall be paid is held to be operative and controlling, and is not unconstitutional.

It was further contended that the hospital steward did not contract the influenza because of his employment as an epidemic of the disease was raging in the city at the time and was so general that every member of the community was exposed to it to a greater or less extent and one out of every ten in the city contracted it. On the other hand, the evidence showed that the incubation period of the disease is from one to four days, that the steward in the course of his duties during the five days preceding his illness had been obliged to handle, and had been exposed to, at least twelve developed cases of influenza; that so far as known he was not exposed to any cases except in the course of his employment; that he lived only half a block from the hospital where he was employed, and during the two weeks preceding his illness had been working very hard and had gone directly from his home to his work and from his work to his home, and had not been out; that his exposure because of his work was far greater than that of the average person; and that among the nurses in the hospitals of the city, a class exposed in much the same degree as he was, the number who contracted the disease varied from 50 to 85 per cent.

Medical testimony also was to the effect that the steward contracted the disease as a result of his

peculiar exposure to it incidental to his employment. The number of persons similarly exposed who were attacked was so great as compared with the number of those not so exposed that it could not be said that the Commission was not justified in concluding from it, in connection with the other facts, that the steward's illness was due to the peculiar exposure of his employment. This conclusion was the more justified by the fact that it coincided with the opinions of most of the physicians who testified. The opinions of physicians on a point of this character are entitled to consideration since it is a part of the vocation of the physician to observe the manner in which diseases are spread and to draw conclusions from such observations.

J. A. CASTAGNINO.

An Insane Person Cannot Be Called in Good Health.

Harris vs. New York Ins. Co. (W. Va.), 104 S. E. R., p. 121.

The insurance company set forth that among the replies made by the insured in her application she stated that her father had died at the age of 65 years from septicæmia, that he had been ill only one month before his death, and that previous to the last month of his life his health had been good. It was discovered, however, that until one month prior to his death her father had paresis and had been confined in an insane asylum for nine years. As to the condition of his health prior to the illness which resulted in his death it might be said that the answer of the insured was but the expression of an opinion on her part. Such an opinion, however, must be an honest opinion and made in good faith. As the insured knew that her father had been afflicted with paresis for nine years and had been confined in an insane asylum because of that affliction it cannot be said that her answer was made in good faith. The argument was brought up also that insanity is not a disease within the meaning of the policy, but the court held that a mental disease is no less a disease than a physical disease.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Cunéo, B., and Picot, G.: The Technique of Perineal Hysterectomy for Cancer of the Uterine Cervix (Technique de l'hystérectomie périnéale pour cancer du col de l'utérus). *J. de chir.*, 1921, xvii, 193.

In the authors' opinion perineal hysterectomy ought to be better known and more frequently used. They do not propose to substitute it for abdominal hysterectomy, but state that every surgeon, even though he be a partisan of abdominal hysterectomy, knows that often the latter is not applicable and that in such cases the perineal method can be substituted advantageously. In this article the authors describe the use of perineal hysterectomy only in cases of cancer of the cervix. Like the majority of French surgeons they believe that the enlarged abdominal hysterectomy is usually the method of choice in cervical cancer, but when the patient is more or less obese and the abdominal wall and deep organs are very fat, the surgeon works with difficulty by the abdominal route. In such patients the perineal region differs but slightly from the normal.

Spinal anaesthesia is the method of choice. The patient is placed in the reversed perineal position. The incision is that of Zuckerkandl's perineal laparotomy. The vagina is separated from the rectum as far as the Douglas pouch. The further stages of the operation consist of incision of the posterior vaginal wall; transverse incision of the vagina; closure of the vagina with liberation of the vaginal segment above the section made posteriorly up to the Douglas pouch; denudation of the lateral walls; denudation of the cervix and proper disposition of the ureters; exposure of the vesico-uterine peritoneal cul-de-sac; methodical ligation of the arteries; bilateral section of the uterosacral ligaments; ligation of the round and lumbo-uterine ligaments; ablation of the uterus and adnexa; toilet of intestinal loops; and closure. The authors prefer to reconstruct the posterior wall from what remains of the vagina by suturing and to tampon the rectovaginal space.

It is not essential that the different stages of the operation follow each other in the order given; variations may be made according to the judgment of the surgeon.

It is best not to cut into the uterus any more than necessary but a limited anterior hemisection may be of advantage.

Clinically perceptible extension of the lesions is a contra-indication to perineal hysterectomy, and if extension is found in the course of operation operative complications are to be expected.

The mortality of perineal hysterectomy is very low if care is taken to operate only in cases in which the neoplastic infiltration is relatively limited. Other things being equal, perineal hysterectomy is unquestionably less serious than abdominal hysterectomy.

The end-results are very satisfactory. The authors' first operations were performed about twelve years ago and several of the patients are still without recurrence. Such a result is not surprising as the perineal route permits just as wide removal of the parametrium as the abdominal route. Ablation of the glands however, is impossible by the perineal route.

W. A. BRENNAN.

Okinczyc, J., and Huet, P. A.: A Case of Didelphic Uterus: Unilateral Salpingitis and Unilateral Hysterectomy (Un cas d'utérus didelphe; salpingite unilatérale et hystérectomie unilatérale). *Gynéc. et obst.*, 1921, iii, 15.

The authors' case was that of a woman of 21 years who entered the hospital on account of pain in the right side following an abortion during the third month of pregnancy.

Clinical examination showed two independent vaginae. The right vagina showed no trace of a hymen, but the hymen in the left vagina was almost intact, being disinserted only from the septum separating the two vaginae. There was also a double cervix. Above the symphysis and to the right of the median line a mass could be felt which resembled a small uterus in anteflexion and was painful on palpation. In the right Douglas pouch was a round fluctuating, mobile, and painful tumefaction.

Operation confirmed the clinical findings. There were two unicornate uteri. The left organ was small but its round ligament and adnexa were entirely normal. The right uterus was larger and slightly adherent to a diseased adnexal mass covered by the omentum. The two uteri were separated by a vesicorectal septum. Subtotal hysterectomy on the right side was followed by recovery.

The patient had never suspected the presence of the malformation and it had not been discovered by physicians who made earlier examinations. It had offered no obstacle to menstruation. These facts suggest that malformations of this type may not be so rare as is believed. The abortion was attributed by the patient to a fall, but the malformation may have been the real cause. A malformation of this type, however, is perfectly compatible with a normal pregnancy. In such cases also utero-adnexal lesions are strictly unilateral if only one vagina has been infected.

The implantation of the tubes was normal and each uterus had a broad ligament which was normal

but small. The intraligamentary position of the uterus on the right side was also normal and the ureter had not been compressed. The internal border of each uterus was in no way attached to the vesicorectal septum separating the uteri from each other. Such a septum has been found in a number of cases of didelphic uteri and in the authors' opinion is a rest of the wolffian and muellerian ducts.

W. A. BRENNAN.

ADNEXAL AND PERI-UTERINE CONDITIONS

Greenberg, J. P.: A Clinical Study of Tuberculous Salpingitis Based upon 200 Cases. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 52.

The findings in 200 cases of tuberculous salpingitis and the conclusions drawn from them are summarized as follows:

1. Tuberculous salpingitis was found in nearly 1 per cent of all women admitted to the gynecological service of the Johns Hopkins Hospital.

2. It was found one and a half times as frequently among colored women as among white women.

3. Out of every 13 abnormal tubes removed at operation, 1 was tuberculous.

4. Nearly three-fourths of the patients were between 20 and 40 years of age.

5. Sixty per cent of the married patients were sterile.

6. A family history of tuberculosis was reported in 22.5 per cent of the cases, while in an additional 2.5 per cent the consort had active pulmonary tuberculosis.

7. The chief complaint was pain (74.5 per cent). Usually this was situated in the lower abdomen (82.5 per cent).

8. Not much information was obtained from the menstrual history. However, 62 per cent of the patients had dysmenorrhœa and 41.5 per cent had menorrhagia. Only 6.5 per cent had amenorrhœa.

9. Seventy-two per cent of the patients had leucorrhœa.

10. Nearly half of the patients had dysuria, nycturia, or pollakiuria.

11. More than half of the patients were constipated.

12. Approximately one-fourth of the patients attributed the onset of their symptoms to some uterine activity (menstruation, pregnancy, etc.).

13. Half of the patients had lost weight during their illness.

14. The physical examination presented no characteristic findings.

15. About one-fourth of the patients had pulmonary tuberculosis.

16. Pre-operative elevation of temperature was recorded in 62.5 per cent of the cases.

17. There was usually either an absolute or a relative leukopenia.

18. In one-half of the cases the hæmoglobin was below normal limits.

19. The correct diagnosis before operation was made in only 13 per cent of the cases and in more than half of these it was aided by ascites.

20. A radical operation was performed in 53 per cent of the cases.

21. Complications during operation occurred in 14.5 per cent.

22. One hundred and four cases were drained. In 17.3 per cent of these a fæcal fistula developed. Abdominal fæcal fistulæ occurred three times more frequently among the cases drained abdominally than among those drained through the vagina.

23. In one-third of all the cases there was suppuration of the abdominal incision.

24. There was no fæcal fistula in any case not drained.

25. The incidence of fæcal fistulæ among the cases in which the bowel had been injured was 48 per cent, whereas among the cases in which the intestines had remained intact it was only 3.4 per cent. The patients with pre-operative fever developed fæcal fistulæ more than twice as frequently as those without fever.

26. Urinary fistulæ occurred 5 times (2.5 per cent).

27. The order of frequency of involvement of the pelvic organs was as follows: tubes, uterus, ovaries, cervix, and vagina. Tuberculosis of these organs was found associated with tubal tuberculosis as follows: uterus, 72.6 per cent; ovaries, 33.1 per cent; cervix, 3.5 per cent; and vagina, 0.5 per cent.

28. In 99 per cent of the cases both tubes were involved.

29. In 68 per cent the peritoneum was involved, and in 3 per cent the appendix was tuberculous.

30. In 17 per cent myomata uteri were associated with the tuberculous process.

31. In only 2 per cent was there associated involvement of the urinary tract.

32. The prognosis is grave in the presence of tuberculosis elsewhere in the body, when there is fever, and when the peritoneum is involved.

33. The operative mortality was 7.6 per cent. This includes all the patients who died in the hospital.

34. By means of follow-up letters, etc., 90 patients were traced. Out of this number, 78 were found to be living from two months to thirty years after the operation. Nearly all those who are alive are in good condition.

EUGENE CARY.

MISCELLANEOUS

Corner, G. W.: Internal Migration of the Ovum. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 78.

An ovum discharged from an ovary may pass through the opposite tube, and when the uterus is bicornate, may find lodgment in the opposite uterine cavity. In swines' uteri, which are long, tubular, and bicornate in type, it is frequently found that one horn contains a greater number of

embryos and the other a smaller number than the number of corpora lutea in the corresponding ovary.

In human uteri detection of this phenomenon is difficult, but clear cases have been reported, such as cases of tubal pregnancy in which the corpus luteum was found in the opposite ovary and cases in which pregnancy occurred when one ovary and the opposite tube were removed.

It is obvious that there are two possible modes of migration; the ova either pass from the ovary into the abdominal cavity and thence directly into the opposite tube (external migration), or they travel by way of the homolateral tube into the uterus and thence to an area of implantation in the contralateral cornu (internal migration). In man, the rabbit, and the cat, in whom the distal tubal extremity opens freely into the abdominal cavity, there is no anatomical bar to external migration. External migration is favored also by the action of the cilia and by the peristaltic waves of the tubes.

In swine, Corner has shown experimentally that migration occurs usually by the internal route. He believes that the reason for the migration is physiological; that it occurs in order that individual embryos of large litters may have a fair share of space in the uterine cavity. Since the right and left ovaries often discharge very unequal numbers of ova, overcrowding would result in one cornu were it not for the migration which occurs from the more crowded to the less crowded side and thus evens the number of embryos in each cornu.

The anatomical mechanism of internal migration is open to discussion, but there can be very little doubt that embryos are shifted by the peristaltic action of the uterine musculature. This must be postulated in order to explain the regular spacing of implanted embryos in the uterine cavity of swine.

SAMUEL KAHN.

Graves, W. P.: The Gynecological Significance of Appendicitis in Early Life. *Arch. Surg.*, 1921, ii, 315.

The author reviews this subject with especial reference to that neglected aspect of it which is represented by the infections descending from the appendix as a primary focus. His attention has often been drawn to this condition by encountering extensive pelvic adhesions in women who had suffered from early appendicitis and in whom the chance of a gonorrhoeal or a puerperal infection could be excluded.

Clado's ligament exerts at the most only an incidental influence in conducting infection to or from the pelvis.

A primarily affected appendix may transmit its infectious process to the pelvis by contact, by gravity, and through the agency of the subperitoneal cellular tissue. Inflammations of the pelvic organs involve the appendix secondarily only by contact. This statement applies to gonorrhoeal salpingitis, puerperal peritonitis, and neoplastic tumors of the uterus and its adnexa. It is probably pertinent also for the most part to genital tuberculosis.

It is noted that unless the implicating process is very destructive, appendicitis secondary to inflammation of the adnexa is of the nature of a peri-appendicitis. On the other hand, infectious processes transmitted to the pelvis from a primary appendicitis by gravity or contiguity are essentially peritonitic in character so that a secondary salpingitis, for example, would ordinarily be of the nature of a perisalpingitis.

It is entirely probable that during the inflammatory periods of a chronic appendicitis a serous or serofibrinous exudate is produced which finds its way by gravity into the true pelvis. Such an exudate is often encountered in apparently uncomplicated pelves.

The pathologic tissue changes which take place later in a secondary pelvic inflammation depend on the severity of the initial appendicular infection. When there has been an overwhelming flood of pus in the pelvis the resulting adhesive peritonitis may be so extreme as to involve the uterus and adnexa on both sides. The immature uterus becomes fixed, usually in the position of retrocessed ante-flexion, and is prevented from attaining its full development.

One of the most serious consequences of appendicitis in early life with pelvic involvement is sterility.

In a series of 47 cases of ectopic pregnancy Graves found the condition only slightly more frequent on the right side than on the left side. In the right-sided cases the appendix was found diseased in 80 per cent, whereas in the left-sided cases it was diseased in only 57 per cent. These figures, though based on only a small number of cases, are at least suggestive that appendicitis must be reckoned with as an important factor in extra-uterine pregnancy.

In a high percentage of the cases of genital abnormalities which produce symptoms of essential dysmenorrhœa there is associated disease of the appendix. The question as to whether there is any causal relationship between the two conditions has not yet been satisfactorily answered.

Three cases are reported.

E. L. CORNELL.

Williams, J. T.: Primary Disease of the Pelvic Lymphatic Glands. *Boston M. & S. J.*, 1921, clxxxiv, 194.

Williams reports three cases of enlargement of the pelvic glands giving rise to striking clinical manifestations. The observance of these cases has led him to conclude that such glandular enlargements are not infrequent though seldom recognized. The term "primary disease of the pelvic lymphatic glands" is, perhaps, somewhat inaccurate inasmuch as, with the exception of lymphosarcoma or Hodgkin's disease, involvement of any part of the lymphatic tract must be secondary to a process in some other organ or tissue.

In all three cases the mass in the pelvis was close to the pelvic brim and independent of the uterus and its appendages. All of the patients complained

of abdominal pain. In two cases it was restricted to the right iliac fossa, while in one it was localized along the course of the ureter and in the kidney region, being due to occlusion of the ureter by the pressure of the glandular mass. Psoas spasm was present in two cases and must be regarded as an important symptom. An X-ray examination of the spine was necessary to rule out the mass and contracture due to psoas abscess from spinal caries. The white cell count ranged between 9,000 and 11,600.

The treatment of disease of the pelvic lymph glands is the same as that of enlarged or diseased glands elsewhere in the body. A mass containing pus should be opened. When the glands are acutely inflamed but suppuration has not taken place the treatment should be restricted to rest and cold applications. When the enlargement of the glands is sufficient to cause pressure on important organs and does not rapidly subside under palliative treatment, excision is indicated.

Williams' conclusions are that primary enlargement of the pelvic lymph glands is a distinct clinical entity not generally recognized in gynecology and that the diagnosis must be based upon a pelvic mass definitely separate from the uterus and its appendages which gives rise to pain and tenderness referred to the iliac fossa of the affected side, with or without elevation of temperature and with or without psoas spasm on the affected side.

MARGARET I. MALONEY.

Nicolieff, F.: The Transperitoneal Route in the Treatment of Vesico-Utero-Vaginal Fistulae (La via transperitoneale nella cura delle fistole vesico-utero-vaginali). *Riforma med.*, 1921, xxxvii, 199.

In 1919 the author had occasion to treat a complicated vesico-utero-vaginal fistula in a woman 23 years of age. For various reasons the technique of Follin or Trendelenburg or other established procedures could not be well applied in this case, and it appeared to the author that the transperitoneal route, described first by Dittel of Vienna in 1893, was most suitable. While in Dittel's case and a second case treated by Forgue the method failed, both failures were due to errors in technique. Nicolieff concluded that the cause of failure lay in the fact that both Dittel and Forgue sutured the fistula vertically and did not concern themselves with the ureters. In Nicolieff's opinion the isolation of the ureters is necessary in order to obtain complete separation of the bladder from the uterus and vagina and to prevent traction on the sutures in the orifice of the fistula and injury to the ureters in the course of the operation. Moreover, horizontal suture appeared to him to be best adapted to resist lateral strain. An operation based on these conclusions was entirely successful.

Nicolieff believes that the use of the transperitoneal route in the treatment of vesico-utero-vaginal fistula is much simpler in technique than

the transvesical and subperitoneal routes. The only objection that can be made against it is the danger of infecting the peritoneal cavity with urine. This danger can be obviated, however, by taking care to isolate the operative field well with large gauze compresses.

The suturing should be done in three planes with catgut and with round needles. The first plane should include the mucosa alone and the other two planes should be Lembert sutures.

W. A. BRENNAN.

Ward, G. G., Jr.: The Operative Technique Employed in the Closure of an Extensive Vesico-Urethro-Vaginal Fistula. *Surg., Gynec. & Obst.*, 1921, xxxii, 150.

Ward reports the following case:

Mrs. M. S., aged 29, came under his care at the Woman's Hospital in May, 1919, complaining of complete inability to hold the urine since an instrumental delivery four years previously. She had been married eleven years. Ten years previously, when seven months pregnant, she was delivered with instruments of a still-born child. She was lacerated and the lacerations were repaired. The exact nature of the labor is unknown but she was in bed for one month. She then had seven spontaneous miscarriages in the next six years at the end of from two and one-half to five months of pregnancy. Each miscarriage was followed by curettage. On December 8, 1915, when she was six and one-half months pregnant with twins, the membranes ruptured spontaneously and an instrumental delivery was performed. On the seventh day postpartum urine flowed continuously from the bladder. Two months later an unsuccessful attempt was made to close the opening in the bladder, and in the following four years 13 other unsuccessful attempts were made by three different surgeons. Three years ago, during one of these attempts, an abdominal hysterectomy was done, but for what reason it has not been possible to ascertain.

In addition to the continuous escape of urine, the patient complained of a burning pain in the vagina and vulva and above the pubes, and constant distress due to the extensive excoriations over the vulva and thighs.

The patient was a well developed woman, 5 ft., 5 in. in height, weighing 150 lb., and in good general physical condition. The examination showed that the external genitals and the vagina were cedematous, red, and excoriated, numerous phosphatic deposits being embedded deeply in the tissues. The entire anterior vaginal wall and the base of the bladder were absent and the ureters opened into the vagina. The vaginal margins of the fistula were very much inflamed and bled easily when touched. The urethra was absent with the exception of a small, thin quadrangular flap of tissue, $\frac{1}{2}$ to $\frac{3}{4}$ in. in length, which hung dependent from the vestibule and was perforated by the external meatus. The cervix had apparently been ampu-

tated independently, evidently in a supravaginal operation, as a stump could be palpated above the flush vaginal vault. The pelvic floor was moderately relaxed. The possibility of curing this large vesico-urethro-vaginal fistula with loss of the urethra seemed hopeless in view of the extensive loss of tissue.

It was obviously impossible to attempt any operative procedure until the inflamed condition of the parts had been cleared up and the phosphatic deposits had been removed. The patient was kept in bed and treated by means of hot douches and boroglyceride packs. Zinc oxide ointment was used externally. She was given also the preparation so successfully used by Emmet to render the urine acid and to prevent the formation of phosphatic deposits: 1 dr. of benzoic acid, 2 dr. of sodium borate in 8 oz. of water, given in water, one tablespoonful three times a day, the dose being reduced to 1 dr. after four days.

The removal of the phosphatic deposits was an extremely painful process and it was necessary to anesthetize the patient repeatedly. This course of preparatory treatment was continued for a period of six weeks, at the end of which time the inflammation had subsided.

On July 7, 1919, an operation was done. The author gives a great part of the credit for the success of this operation to the fact that it was performed with the patient in the Bozeman position.

A strip of tissue was excised around the margin of the fistula and the vesical mucosa brought together with interrupted sutures of No. 1 tanned catgut. A second layer of silkworm gut was then passed through the vaginal mucosa and denuded tissue to bring the edges together and the flap around the urethra was carried up.

A self-retaining catheter was used for twelve days, being kept clean by irrigation with boric acid solution and changed every four or five days.

On the twelfth day the catheter and the stitches were removed and the result was wholly satisfactory.

EUGENE CARY.

Wharton, L. R.: Pelvic Abscess: A Study Based on a Series of 716 Cases. *Arch. Surg.*, 1921, ii, 246.

The diagnosis of a typical case of pelvic abscess presents but few difficulties. Atypical cases, however, are common and are frequently mistaken for solid and cystic tumors of the pelvic organs.

There are many ways in which a pelvic abscess may originate. In the presence of infection it may be due to the degeneration of pelvic tumors, either benign or malignant, ruptured extra-uterine pregnancy, rupture of the appendix, or rupture of cystic ovarian tumors. Abscesses due primarily to infection in the female genital organs constitute by far the largest group. These are of three clinical types: gonorrhoeal, puerperal, and tuberculous. The classification of cases of pelvic abscess on the basis of the bacteriological findings is usually unsatisfactory because in many instances the organism

which originally caused the infection has disappeared and sterile pus is obtained, while in others secondary invaders have completely masked the picture. However, as the author found that these cases usually fall into three groups on the basis of their clinical characteristics, he has adopted this classification as the basis of his differentiation. While it presents the usual clinical inaccuracies, it corresponds in many instances to the bacteriological findings when they are positive. When viewed from the standpoint of clinical characteristics, the types are fairly distinct—in the history of the development of the disease, its localization, its complications, the postoperative convalescence, the relative mortality, the immediate and ultimate results obtained, and the frequency of subsequent pregnancies. With regard to the diagnosis, tuberculous pelvic abscess forms an exception to the rule. Its nature is not usually recognized before operation.

The complications which are often associated with pelvic abscess and may develop unexpectedly during the convalescence in any case markedly increase the inherent gravity of the disease. Not infrequently their symptoms may be almost completely masked by the greater prominence of those due to the pelvic abscess.

In 67 per cent of all the author's cases of pelvic abscess vaginal incision and drainage was the only operative treatment employed. The nature of this operative procedure and the propinquity of the pelvic abscess to the pelvic viscera favor the occurrence of operative accidents. Because of the anatomical relationships also, pelvic abscesses may rupture spontaneously into the bladder, the rectum, the vagina, or the peritoneal cavity, or may burrow out into the retroperitoneal spaces and spread extensively. Operative or spontaneous rupture into the bladder or rectum leads to the formation of fistulae which greatly prolong the convalescence. In this article the histories of such fistulae are discussed in detail.

The convalescence of patients with pelvic abscess who have been treated by vaginal incision and drainage requires careful surveillance as complications of a serious nature are common and require prompt treatment. The essential factors in the routine postoperative care are the Fowler position and prolonged drainage. The pelvic drains should not be removed for at least ten days. After their removal the drainage tract should be dilated digitally every day or two to preserve its patency. Irrigation of the abscess sac the author condemns. The convalescence of patients with tuberculous abscesses of puerperal origin is usually much more stormy, prolonged, and febrile than that of patients with any other type of pelvic abscess. In every case of pelvic abscess general hygienic measures should be employed to build up the patient's strength.

In all of the author's cases of pelvic abscess, regardless of the type, the mortality following treatment by vaginal incision and drainage was 5.1 per cent. In the gonorrhoeal type it was 4.5 per

cent; in the puerperal type, 12 per cent; and in the tuberculous type, about 25 per cent. It is difficult to obtain accurate statistics with regard to the mortality in cases of tuberculous pelvic abscess because it is probable that in many instances in which laparotomy was not performed the true nature of the infection was not recognized. The most frequent cause of death in these cases is general peritonitis.

The average length of convalescence of patients with pelvic abscess treated by vaginal incision and drainage has been between two and three weeks. Although at the end of this time 88 per cent of the author's patients left the hospital free from symptoms, it would be impossible to state that they were therefore free from the disease as in 92 per cent pelvic abnormalities were palpable, in 47 per cent the temperature was above 98.6° F., and in 37 per cent the pulse rate was more than 100 per minute. Practical conditions beyond the control of the clinician often make it impossible to keep these patients in the hospital as long as is advisable. In practically all of the author's cases, however, the most important result desired was obtained in that the progress of a serious infection was arrested, the development of grave complications was avoided, good health was restored at least temporarily, and the acute symptoms were entirely relieved.

In cases of pelvic abscess which have been treated by vaginal incision and drainage it should be a routine procedure to follow up the hospital treatment by active therapy in the office or dispensary as the infection which has been harbored for months, and in some cases for years, and of which the abscess was only an acute manifestation is still present and may at any time flare up in fulminating form. In some instances two or three months of active office treatment with visits once a week are necessary before the infection seems to be perfectly controlled, the symptoms are entirely relieved, and good health is restored. In three-fourths of the author's cases this end has never been achieved permanently without extirpation of the focus of the infection by an abdominal operation. In deciding the question as to when a second operation of more radical nature should be advised the personal equation is often an important factor. The persistence of definite symptoms, the continuation of poor health, and the presence of pelvic abnormalities which will not yield to medical treatment should be the clinical indications guiding one in giving advice on this question.

Apparently 25 per cent of the author's patients with pelvic abscess have been permanently cured by vaginal incision and drainage. These patients have been relieved of all symptoms and have been in perfect health for periods varying from three to twenty-five years. Twenty-two per cent have been benefited permanently. In 56 per cent of the cases, however, this treatment has resulted in ultimate failure in that the symptoms have not been relieved permanently.

The functional integrity of the pelvic organs as shown by the ability of the patient to become pregnant and give birth to normal children is not always destroyed by a pelvic abscess, although in 87 per cent of the author's cases permanent sterility resulted. It is difficult to see how the vaginal incision and drainage of a pelvic abscess could be a factor in inducing this sterility. About 13 per cent of the author's patients had subsequent pregnancies after being treated for pelvic abscess by vaginal incision and drainage. The ability of a patient to become pregnant, however, is not always an indication that she has been symptomatically cured for in no small number of instances women who have become pregnant after their recovery from pelvic abscess have been symptomatically miserable because of the discomfort and the gastro-intestinal disturbances associated with inflammatory adhesions, chronic appendicitis, or other sequelæ of chronic pelvic inflammatory disease. Although a woman in such a condition may occasionally become pregnant, the author has never seen a pregnancy carried successfully to term when the treatment for pelvic abscess failed symptomatically. He knows of no cases of subsequent pregnancy in patients with tuberculous pelvic abscess. Forty per cent of all the subsequent pregnancies which occurred in women who had been treated for pelvic abscess by vaginal incision and drainage ended in miscarriage, and the incidence of puerperal infections under these circumstances was high. The number of normal children born to patients who have been treated for pelvic abscess by vaginal incision and drainage was considerably greater than the number of deaths due to the disease when it was treated by this procedure.

After having been treated for pelvic abscess by vaginal incision and drainage, 23 per cent of the author's patients had no dysmenorrhœa whatever. In 56 per cent it was less severe, and in 21 per cent it was of equal or greater severity than that experienced before the operation. Eight per cent of the patients ceased menstruating entirely after the development of the pelvic abscess. Because of the fact that these patients were young women who had not been subjected to any radical surgical procedure, this cessation of menstruation seems to indicate the total destruction of the menstrual function by disease.

From 1890 to 1895 the technique of vaginal incision and drainage which was employed in Wharton's clinic was in general like that of Laroyenne. Since 1895 the procedure has been simplified. With regard to a comparison of the results which have been obtained by these two different methods of treatment—the older method of Laroyenne, with the drainage tube and daily irrigations, and the use of simple gauze drainage without irrigations—Wharton believes it sufficient to state that both the immediate and ultimate results of the simpler and safer method have been as satisfactory as those of the procedures formerly in vogue, but in neither case have they fulfilled the hopes of those who developed these operative procedures.

On the basis of a study of 462 cases of pelvic abscess treated by vaginal incision and drainage it seems that this operative procedure has two distinct functions: (1) as a method of pelvic diagnosis; (2) as a method of treatment. In the presence of pelvic tumors of uncertain origin a vaginal incision will often establish the diagnosis and place the operative indications on a rational basis. As a therapeutic procedure in pelvic abscess it has been most uniformly successful in giving drainage to pelvic collections, checking the spread of the infection and relieving the patient of immediate symptoms and the danger of complications. This much can be accomplished almost always by this procedure. In 25 per cent of all of the author's patients the relief has proved to be lasting. In 75 per cent, however, it has been only temporary, a large number of the patients having returned to the hospital for operative treatment of a more radical nature. In these cases the previous drainage of the pelvic abscess rendered it both safer and easier to perform operations of a conservative nature.

E. L. CORNELL.

Lapham, M. E.: The Adrenalin Hypertension of the Climacteric. *Woman's M. J.*, 1921, xxviii, 51.

When the production of vasodilating and hypotensive substances by the reproductive system becomes inadequate, the adrenalin tends to become unduly influential.

In cases of unstability of the autonomous nervous system adrenalin predominance may cause in-

stability of the vasomotor and heat centers as shown by the vasomotor phenomena of the climacteric.

The hypertension of the climacteric may be associated with cardiovascular, cardiorenal, and pancreatic strain leading to the formation of cardiac, renal, and pancreatic disease.

The irritability of the sympathetic nervous system may cause glycosuria, hyperglycemia, and the diabetic diathesis.

The stimulating effect of adrenalin upon the suprarenals as a whole may cause an over-production of cholesterolin in the blood which is closely associated etiologically with biliary lithiasis as well as with xanthematous manifestations.

Since this undue influence of adrenalin originates just when the reproductive system fails in its production of vasodilating and hypotensive stimuli, the administration of these stimuli is logically indicated to counteract the influence of the adrenalin.

The desiccated substance of all the sex glands, the pituitary, and the thyroid represents these stimuli. If there are no indications of increased cholesterolin production, the suprarenal cortex may be used with great advantage.

If there are indications of hyperthyroidism the use of thyroid substance should be carefully considered. Thyroid substance should not be given unless the secondary compensatory nature of the hyperthyroidism can be traced.

Large doses of the sex glands and small doses of the thyroid and pituitary should be used.

C. H. DAVIS.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Haffner, R.: So-Called Placental Infarcts and Their Relation to the Albuminuria of Pregnancy (Les soi-disant infarctus placentaires et leur relation avec l'albuminurie de la grossesse). *Gynéc. et obst.*, 1921, ii, 81.

This article is based upon the examination of the urine in 400 cases of pregnancy. Albumin was found in 73 cases. In almost half of the cases of albuminuria the placenta was intact. In a great number of the others, the group which included the majority of the cases of nephritis and eclampsia, the placental changes were very slight. In no instance were they so marked that they disturbed the nutrition of the fœtus. In 77½ per cent of the cases in which a placental change was found the urine was free from albumin.

In the formation of fibrinous patches in the placenta two processes are responsible, circulatory disturbances and hyaline degeneration of the chorionic villi with proliferation of ectodermal cells. The exact pathogenesis of this condition, however, is still not clear. Endometritis and syphilis as contributory factors may be ruled out. It is probable that in the great majority of cases the cause is to be found in the circulation.

Of the 77½ per cent of the cases of placental change in which the urine did not show albumin Haffner found recently formed fibrinous patches in 30 per cent. In another group of 27 cases in which recent or old fibrinous foci were discovered there was no albuminuria during pregnancy or labor. In a few cases in which albuminuria was observed during the last days of pregnancy and the placenta showed old fibrinous patches a relationship between the albuminuria and the placental changes could be excluded as the latter were of much longer duration than the former. From these cases as well as those with placental changes but without albuminuria it may be concluded that albuminuria is of no primary importance in the formation of placental infarcts.

In cases of nephritis and eclampsia the author found the placenta intact or only slightly changed in 10 cases while in a large number in which the placenta exactly resembled the type believed to be associated with albuminuria no trace of albumin was found in the urine. Accordingly there was no direct relationship between the nephritis and the fibrinous areas.

W. A. BRENNAN.

Martius, H.: Prophylactic Cæsarean Section (Der prophylaktische Kaiserschnitt). *Zentralbl. f. Gynaek.*, 1921, xlv, 161.

The possibility of effecting delivery by abdominal section even in unclean cases has increased the

prophylactic use of cæsarean section and decreased that of artificial premature delivery and version. The author prefers the deep, intra-abdominal cæsarean section. The extraperitoneal incision has been given up on account of the danger of injuring the bladder and because the peritoneum is less sensitive to infection than the cellular tissue. Martius mentions a case in which, in spite of the presence of streptococci in the amniotic fluid and marked supuration of the skin wound, the abdomen was not infected.

In cases not too severely infected (the condition of the pulse is important in judging the degree of infection) perabdominal cæsarean section is performed. The indications for cæsarean section are a dead child and a conjugate less than 6 cm. or a living child and a conjugate of 7.5 cm. or less. When the child is dead and the conjugate is more than 6 cm. perforation is indicated, but when the child is living and the conjugate is over 7.5 cm. the treatment of primiparæ and others not too severely infected is expectant. In the cases of multiparæ whose previous deliveries have been difficult, cæsarean section is performed soon after the beginning of pains (prophylactic cæsarean section). Formerly prophylactic version was done. In the cases of primiparæ and multiparæ with a conjugate over 7.5 cm. prophylactic section should be performed without waiting for the thinning of the lower uterine segment, beginning fever, and the development of poor heart tones, which offer absolute indications.

Like Lichtenstein, the author advocates delivery by section in cases of unfavorable presentation when the bag of waters has ruptured and the pains are not exerting any effect, even though it is not certain that the canal is uninfected. If after two or three hours of severe pains there has been no moulding or further progress of the head, operation should be performed, regardless of early rupture of the bag of waters, previous vaginal examinations, or a rise in temperature.

In cases of severe infection with purulent liquor amnii, tympany of the uterus, and small, frequent pulse, total extirpation of the emptied uterus is indicated if the child is living. If the child is dead, perforation is done. Unfortunately, perforation of the living child is not always avoidable. If conservative section cannot be considered on account of the severity of the infection, the uncertain life of the child is sacrificed by perforation in order to preserve the possibility of further pregnancies which would be destroyed by total extirpation. However, by delivery by prophylactic section at the right time the frequency of this procedure can be greatly limited.

KULENKAMPFF (Z).

Constantinesco, P.: The Cæsarean Operation in the Treatment of Perforated Wounds of the Abdomen and Gravid Uterus (*L'opération césarienne comme traitement des plaies pénétrantes de l'abdomen et de l'utérus gravide*). *Presse méd.*, Par., 1921, xxix, 135.

A countrywoman in the ninth month of pregnancy near term received a perforating injury in the abdomen through which the umbilical cord protruded. She was taken immediately to a hospital where an abdominal cæsarean section with abdominal and vaginal drainage was done. The child was extracted living and in good condition and the mother left the hospital forty-five days later in excellent health.

According to surgical principles a wound of the uterus, being a wound of a hollow organ, should be surgically treated by evacuation and drainage. In a penetrating abdomino-uterine wound without infection—that is, when the patient is seen immediately after the accident—the conservative cæsarean operation with double drainage is the best treatment based on the surgical indications. If such a wound is infected—that is, when the patient is not seen until from twenty-four to forty-eight hours after the accident—the cæsarean operation with total hysterectomy and double drainage is indicated.

W. A. BRENNAN.

LABOR AND ITS COMPLICATIONS

Grattan, J. F.: Pudendal Hernia; Operation by Abdominal Route; No Recurrence in Two Years. *Surg., Gynec. & Obst.*, 1921, xxxii, 131.

Grattan states that this type of hernia is rare as Moschowitz collected only eleven authentic cases. None of these was cured by operation. The hernia is caused by difficult labor, the strain of which separates the levator ani fibers and causes the descent of the protruding viscus through the normally weak triangle bounded by the ischio-cavernosus, constrictor cunei, and transversus perinei.

The symptoms of this condition in Grattan's case were "irritation in the rectum with difficulty in moving the bowels (enemata being used) and, in addition, a bearing-down sensation in the vagina."

The general physical examination was negative. The vaginal and proctoscopic examinations showed nothing unusual. While the examining fingers were in the vagina, however, the development of a swelling about the size of a hen's egg was noted when the patient coughed. This mass, which was soft and reducible and gurgled, was external to the left labium majus. Its development was associated with an increase of the symptoms.

The herniation was approached by the abdominal route. Exposure of the pelvic organs revealed the descent of the sigmoid loop through a triangular opening in the floor of the pelvis. This opening was bounded anteriorly by the posterior reflection of the left broad ligament, mesially by the lower segment of the uterus and the left uterosacral ligament,

and laterally and posteriorly by the rectum. The sigmoid being fixed at its point of continuation into the rectum, appeared to slide down along the posterior surface of the broad ligament and disappear through the hernial opening. Practically the entire loop was out of view.

Gentle traction brought the entire sigmoid loop out of the sac. There were no surface adhesions and no evidences of constriction at any point. The opening was triangular in outline, the uterosacral ligament forming the base, the reflection of the broad ligament the anterior arm, and the rectum (in an irregular sense) the posterior arm of the triangle.

There was no process of the sac descending into the left labium as in the cases of "pudendal" hernia reviewed by Moschowitz. However, the exit and course of the descent in this case were undoubtedly the same, the final destination being the subcutaneous tissue of the upper adductor region of the thigh rather than the labium.

The protrusion undoubtedly occurred through a rent in the levator ani muscle and passed through the triangle bounded externally by the ischio-cavernosus, internally by the constrictor cunei, and posteriorly by the transversus perinei, and along the left lateral wall of the vagina, emerging in the thigh.

No attempt was made to extirpate the sac. Five or six mattress sutures of double Pagenstecher linen were passed across the long arms of the triangle, closing it tightly.

Two years have elapsed since this case was operated upon and repeated examinations fail to show recurrence. The patient has performed all the heavy work of the household during these two years.

EUGENE CARY.

Schickelé, G.: A Voluminous Retroplacental Hæmatoma Formed During Delivery and Simulating Uterine Rupture (*Hématome rétro-placentaire volumineux au cours de la période de délivrance simulant une rupture utérine*). *Gynéc. et obst.*, 1921, iii, 204.

Shortly after spontaneous delivery, a primipara, aged 22 years, showed symptoms of internal hæmorrhage which led to the diagnosis of rupture of the uterus. There was no blood loss by the vagina and the uterus was well contracted. Bulging was noted in the region over the symphysis and there were strong pains in the lumbar region. The placenta with its foetal surface presenting blocked the vulvar opening. Its extraction, which was easily effected, gave issue to several large clots and a considerable quantity of fluid blood. Palpation by the hand inserted in the vagina revealed no rent in the uterus.

An exploratory laparotomy was done. There was no blood in the abdomen and no uterine tear. The peritoneum also was intact. The patient died with the symptoms of acute anæmia but autopsy showed that the blood loss, though considerable,

was not the immediate cause of death, the fatal termination being due rather to heart and kidney trouble of long standing aggravated by the pregnancy. There was also an acute endocarditis.

The curious point in the case is that the placenta, although spontaneously detached, was not expelled. The hæmorrhage was produced during the detachment. By some obscure mechanism the detached placenta with the foetal surface downward almost hermetically sealed the vagina. All the blood, therefore, was accumulated behind it and caused the bulging over the symphysis. The placental detachment was of the Baudelocque type. The retroplacental hæmorrhage was rapid and there was atony of the cervix, vagina, and the lower third of the uterus.

W. A. BRENNAN.

Vilaplana, J. M.: Premature Separation of the Placenta Normally Inserted (Disinsercion prematura de la placenta normalmente insertada). *Rev. españ. de med. y cirug.*, 1920, iii, 590.

In order to ascertain the frequency of intraplacental hæmorrhage and its relationship to retroplacental hæmorrhage the author examined 1,015 placenta. Of these, 967 showed no signs of premature disengagement, and 293 (30.29 per cent) showed intraplacental hæmorrhage. In 37 cases there was retroplacental hæmorrhage, and of these, 27 showed intraplacental hæmorrhage in addition. In 11 cases of clinically premature separation, 10 (91 per cent) showed intraplacental hæmorrhage. In 26 cases of eclampsia there were 16 intraplacental and 8 retroplacental hæmorrhages. In 61 cases of albuminuria and œdema there were 26 intraplacental and 3 retroplacental hæmorrhages. In 124 cases of albuminuria there were 61 intraplacental and 7 retroplacental hæmorrhages. In 575 cases labor took place without any hæmorrhage.

The author concludes that toxæmias of pregnancy are frequently the cause of placental hæmorrhages. Retroplacental hæmorrhages are generally independent of intraplacental bleeding, but the two may coexist. Degeneration, necrosis, and inflammatory processes in the placenta are not the usual causes of such hæmorrhages. Albuminuria, eclampsia, and retroplacental hæmorrhages are all manifestations of toxæmic conditions of pregnancy. Albumin was found in 75 per cent of the cases. In 39 per cent of these the condition was due to renal affections and in 20 per cent the amount was insignificant. Small placental hæmatomata commonly occur in primiparæ without any external manifestations of hæmorrhage. In multiparæ the hæmatomata are larger.

The complications mentioned may lead to the interruption of pregnancy. In two-thirds of all cases the interruption occurred in the last three months. The treatment in such cases is directed toward saving the life of the mother. Expulsion does not usually take place spontaneously. Tamponade is not advisable. The membranes should be ruptured to accelerate labor and prevent further

hæmorrhage. Version and extraction should be done, or if the dilatation of the cervix is sufficient, forceps should be applied. Insufficient dilatation may be overcome by incising the cervix. When rigidity of the cervix persists, abdominal cæsarean section is indicated.

W. R. MEEKER.

Dutrey, J.: The Importance of Circles of the Cord About the Neck in Subcutaneous Symphysiotomy by the Frank-Zarate Method (Sinfisiotomía subcutánea Frank-Zarate; importancia de las circulares del cordón). *Semana méd.*, 1920, xxvii, 851.

In a case of contracted pelvis subcutaneous symphysiotomy by the Frank-Zarate method was performed and was followed by spontaneous delivery. The foetus had two turns of the cord around its neck and died a few minutes before expulsion. This case was used as an occasion to study in detail the new subcutaneous symphysiotomy perfected by Zarate. The technique of this procedure is briefly as follows:

With the patient in the obstetrical position after disinfection of the cutaneous surfaces with iodine, two assistants support the legs in flexion and abduction. The operator then introduces two fingers of the left hand into the vagina, displacing the urethra to the right and thus keeping it away from the symphysis. The clitoris is pulled down underneath the arcuate ligament by the thumb where it is held fixed.

The midpoint of the symphysis is next located with a bistoury and the skin and subcutaneous tissues are punctured. The anterior ligament is cut from above downward and then the fibrocartilage. The entire fibrocartilage having been sectioned as far as the arcuate ligament which is protected with the thumb of the left hand, the two halves are separated by forced abduction of the thighs already flexed upon the abdomen. The bistoury thus comes into contact with the fibers of the arcuate ligament and the latter are sectioned carefully by repeated small incisions. Abduction is increased so that separation of the fibers proceeds about 1 cm. farther. The bistoury is then removed. Its removal is followed by a hæmorrhage of 20 to 30 c.cm. of blood. In the space thus made compression is exerted by the vaginal fingers and the thumb outside. The hæmorrhage soon ceases and the small skin incision is sealed with collodion.

The essential difference between Frank's technique and that of Zarate lies in the method of attacking the arcuate ligament. In the former the entire arcuate ligament is sectioned at once, while in the latter the uppermost coarse fibers are cut, a few at a time, and the remainder are torn from their insertion by forced abduction, rupture of the corpus cavernosum of the clitoris being thus avoided. Wounds of the vaginal wall are also prevented by the guiding fingers in the vagina. Hæmorrhage is very slight and hæmatomata are rare so that consequent thrombophlebitis is avoided.

In the case reported there had been premature rupture of the membranes, the foetus was large, the pelvis moderately contracted, and labor had been in progress thirty-three hours. Under chloroform anæsthesia subcutaneous symphysiotomy was performed, giving a separation of about 3 cm. The foetal heart tones were distinct at this time. Pituitrin was given. About one-half hour later the heart tones could not be heard. Fifteen minutes later the foetus was born with the cord wrapped twice around its neck. Autopsy showed that the child died from asphyxia. The author regards circles of the cord about the neck as a contra-indication to symphysiotomy. Their presence should first be determined if possible by deep digital examination.

W. R. MEEKER.

NEW-BORN

Tennent, R.: Exomphalos, or Hernia into the Umbilical Cord. *Brit. M. J.*, 1921, i, 263.

Exomphalos is a hernia of the abdominal viscera into the umbilical cord. It has been estimated that the condition occurs once in from 600 to 2,000 births. The abnormality consists of a globular asymmetrical swelling situated at the abdominal attachment of the cord and extending into its sub-

stance. The coverings are often light gray in color and sufficiently transparent to reveal the sac contents. In other cases the color is darker and the sac opaque. The sac consists of three layers, amnion, Wharton's jelly, and peritoneum. Usually it contains a part of the intestinal tract and not infrequently a Meckel diverticulum.

Rarely the contents can be reduced into the abdomen. Obstruction or strangulation may occur. If treatment is delayed, death is caused speedily by intestinal obstruction or tearing and sloughing of the covering membranes which result in peritonitis. Immediate operation is indicated. The sac having been opened, the contents should be separated and, if healthy, returned to the abdomen. The vessels of the cord should be carefully ligated at the neck of the sac. For the relief of distention and the administration of fluid after operation, an appendicostomy may be done through a stab wound.

With regard to the etiology three factors are considered: antenatal conditions, developmental causes, and defects in function. Abnormal presentation may be the cause. Hydramnios, an unduly short cord, or a persistent omphalovitelline duct is sometimes believed to be responsible. A defect in the development of the mesoblastic layer of the abdominal wall is more probable.

M. R. HOON.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Klika, M.: The Dangers of Pyelography and Their Prevention (Gefahren der Pyelographie und ihre Verhuetung). *Časop. lékař. česk.*, 1921, lix, 633, 647.

Pyelography with the injection of collargol solution into the pelvis of the kidney is not without danger. To avoid accidents Lichtenberg and Joseph have worked out the following technique:

One or two days previously mild laxatives and enemas are given and the bladder is thoroughly irrigated (pyelography is contra-indicated in acute cystitis). Following examination of the bladder a 10 per cent solution of collargol is injected under observation with a No. 4 or 5 ureteral catheter which is thoroughly lubricated in order to prevent injury to the canal. The injection is stopped as soon as the collargol returns into the bladder. The collargol is injected at body temperature, slowly, evenly, and with very little pressure. The use of narcotics is avoided. After the X-ray examination all the collargol is removed by aspiration and irrigation.

In spite of these precautions the author found in a kidney extirpated for tuberculosis numerous microscopic and macroscopic rests of collargol which extended even up to the kidney tubules of the pyramids and into the Henle loops. Following the use of a 10 per cent solution of potassium iodide instead of collargol according to the method of Rubritius the author has not observed injury of the kidney. KINDL (Z).

Caspari: Renal Tuberculosis: A Critical Study of a Series of Cases Treated Surgically (La tuberculose rénale; étude critique d'une série de cas opérés). *J. d'urolog. méd. et chir.*, 1920, x, 329.

The author gives the detailed clinical histories of 16 cases of renal tuberculosis treated by operation. Eleven were those of women and 5 those of men. In most of the cases the right kidney was involved. The age limits of the patients varied from 18 to 57 years.

Caspari's first finding in the histologic study of a number of specimens was that surgical tuberculosis of the kidney develops as a rule from a medullary lesion. In only 7 of his cases did it appear probable that the condition originated in the cortex. The pyramids appeared to favor the bacilli.

In 4 of the cases the kidney was low and mobile, but Caspari does not believe that ptosis plays an important part in the development of renal tuberculosis. Adiposis of the tuberculous kidney was observed in 4 cases.

The specimens showed cavities such as are usually found in the tuberculous kidney. They were arranged

around the central zone of the kidney, involved only a part of the kidney, or were situated irregularly in the parenchyma. In 2 cases cysts were found; one of them contained a calculus.

In about one-third of the cases the kidney pelvis was moderately dilated and showed other signs of tubercular invasion. The ureter was usually inflamed and had thickened walls.

Caspari describes the general symptoms upon which a diagnosis of renal tuberculosis is based. In some cases palpation will not reveal the condition and deep pressure will not provoke the least pain. Examination of the urine for the Koch bacillus is essential. In the author's 16 cases this examination was positive in 12. The absence of the Koch bacillus in the urine, however, does not exclude tuberculosis. Another test of importance is the test of animal inoculation, but even negative inoculation does not rule out the condition.

The best methods of diagnosing renal tuberculosis are cystoscopy and ureteral catheterization. Cystoscopy shows which kidney is diseased and reveals the nature of the cystitis. Ureteral catheterization furnishes reliable information regarding the condition of the ureters and permits separation of the urine from the two kidneys.

As regards the treatment Caspari states that anatomical and clinical facts show that renal tuberculosis does not become cured spontaneously. In none of the kidneys removed in his cases was there any evidence whatever of a tendency toward spontaneous recovery. Surgical treatment alone puts an end to the lesions. Operation should be performed as soon as the condition has been diagnosed if the other kidney has been found normal. Anæsthesia should be induced with pure ether because kidney tuberculosis is secondary to pulmonary tuberculosis and therefore irritation of the lung must be avoided. The author uses 2 parts of chloroform to 1 part of ether. As a rule an extra-peritoneal lumbar nephrectomy is done and extra-capsular removal of the kidney effected. Two large drains are then placed in the cavity.

Renal tuberculosis is curable if nephrectomy is performed at the earliest possible date.

W. A. BRENNAN.

BLADDER, URETHRA, AND PENIS

Melen, D. R.: An Aid in the Diagnosis of Tumor of the Urinary Bladder. *J. Am. M. Ass.*, 1921, lxxvi, 782.

Occasionally in cases of tumor of the bladder cystoscopy is impossible because of congenital or acquired stricture, hypertrophy of the prostate, adenoma of Albarran's lobe, or some similar con-

dition, profuse bleeding, or intolerant or contracted bladder.

In this type of case the author suggests the use of cystograms. A case is reported and the following conclusions are drawn:

1. It is possible to demonstrate a tumor of the bladder by means of the roentgen ray.

2. The older methods—injecting the bladder with air or an opaque solution—will not always demonstrate the tumor.

3. An air cystogram should be taken first, a second picture made after the bladder has been filled with 15 or 25 per cent sodium bromide solution, and a third picture made immediately after the bladder is emptied.

JOHN P. O'NEIL.

Levy-Weissmann: Perforation of the Prostatic Urethra by a Shell Fragment (Perforation de l'urèthre prostatique par éclat d'obus). *J. d'urolog. méd. et chir.*, 1920, x, 271.

The case reported was that of a soldier. A few days following an injury of the buttocks the urine became purulent and contained slight traces of blood. The examination and the history excluded gonorrhœal infection. Urethral catheterization was impossible as the finest bougies were stopped by some deep obstacle in the canal. By rectal palpation a projectile was located in the urethral canal at the site of the prostate. The condition was diagnosed as perforation of the prostatic urethra by a shell fragment. This diagnosis was confirmed two days later by the emission of urine through the projectile orifice in the buttock.

Operation showed extensive destruction of the urethral walls but urination was possible as the projectile partially re-formed the canal wall though it reduced its lumen. The pus came from the disintegrated tissues around the projectile and this disintegration was responsible for the communication established between the urethra and the trajectory of the projectile. The author treated the case by the introduction of a retention catheter, thus avoiding a suprapubic cystotomy with retrograde drainage.

W. A. BRENNAN.

Davis, E. G.: The Young-Stone Operation for Urethrorectal Fistula; Report of Three Cases. *Surg., Gynec. & Obst.*, 1921, xxxii, 225.

The Young-Stone operation for urethrorectal fistula is essentially an exaggerated Whitehead hæmorrhoid operation in which a cuff of the rectum is dissected free and pulled down far enough so that amputation may be performed above the fistulous opening. Other important features of the procedure are suprapubic drainage, closure of the urethral fistula, and the bringing together of the fascia and levator fibers in the midline to act as a barrier between the urethra and rectum. Davis shows each step of the operation by a drawing.

Less radical procedures are frequently failures as proved by the fact that in one case which was successfully operated upon by the method described

as many as eight previous attempts to close a fistula had been unsuccessful.

The Young-Stone operation is not used in cases of tuberculous or neoplastic origin, but is indicated for fistulæ produced by surgical trauma such as may occur in perineal lithotomy, drainage of prostatic abscesses, and perineal prostatectomy.

The urethral fistula is usually in the membranous urethra but may be in the prostatic portion.

The histories and results of three successful operations are given in detail. HARRY CULVER.

GENITAL ORGANS

Kretschmer, H. L.: Abscess of the Prostate. *Surg., Gynec. & Obst.*, 1921, xxxii, 259.

This paper is based upon a series of 43 cases of prostatic abscess.

Attention is directed to the fact that while this condition is frequently a complication of gonorrhœa, gonorrhœa is by no means the only cause as it may occur as a complication of other acute infectious diseases such as typhoid fever, mumps, and influenza and may be produced from some distant focus by metastasis.

The series of cases reviewed are grouped as follows: (1) cases complicating gonorrhœa; (2) those of metastatic origin; (3) those following instrumentation; (4) those associated with hypertrophy; (5) those associated with urethral stricture; (6) those associated with appendicitis; (7) those associated with stone; (8) those in which the etiology is undetermined; and (9) those due to general sepsis.

Thirty patients gave a history of recent or remote gonorrhœal infection, while in 16 cases a positive smear was obtained at the time of the development of the abscess. Pus from the abscess contained gonococci in 18 cases, staphylococci in 5, streptococci in 1, both staphylococci and streptococci in 2, and bacillus coli in 1.

A moderate leucocytosis was noted in all cases in which this factor was determined. The highest count was 30,000.

In metastatic prostatic abscess the primary focus usually dominates the picture until complete retention of urine occurs or defæcation is painful and difficult, when a rectal examination will reveal the complication. The usual type of primary lesion producing this complication is phlegmon of the extremities or phlegmonous angina, acute tonsillitis, furunculosis, or carbuncles.

Instrumentation was the probable cause in 17 of the 43 cases. Such injury may occur in patients with venereal disease as well as in those not so affected.

Abscess associated with hypertrophy of the prostate was noted in several instances and is frequently a difficult condition to diagnose.

In 1 case in which there was a urethral stricture the abscess followed dilatation, the latter being undoubtedly a predisposing factor. Another patient developed abscess thirty-one days after the removal

of a suppurating appendix. As there had not been urethral instrumentation of any kind, Kretschmer is of the opinion that there might be a causal relationship between the two conditions. Prostatic stone was found associated with abscess in one instance.

Occasionally no etiologic factor can be demonstrated. In such instances the adjacent viscera should be carefully examined and the possibility of distant foci kept in mind.

As at times the clinical picture is that of general sepsis, the true nature of the condition is not known until late in its course. In other cases abscess of the prostate may be a part of a general sepsis or even the cause of the general sepsis.

There is no appreciable difference in the symptoms in the venereal and non-venereal cases after the abscess has developed. Essentially they consist of frequency of urination which varies greatly in duration in different persons; pain, which in one form or another is almost constantly present and is suprapubic when associated with a full bladder, perineal when associated with a sense of fullness, or associated with micturition, either initial or terminal; complete retention of urine necessitating catheterization, a frequent symptom varying in duration from eight days to twelve hours; difficult urination; rectal pain which may or may not be associated with the act of defecation; other abnormal rectal sensations such as fullness and warmth; and chills and fever.

Rectal examination elicited palpatory findings in all of the cases reviewed. In advanced cases the diagnosis is easy. In early cases it is more difficult and frequently dependent upon the finding of a definite circumscribed area of tenderness and pain.

Abscesses of the prostate may terminate by resolution, rupture, or operation. In the cases reviewed only 4 terminated by resolution. Rupture may be spontaneous or due to light trauma such as straining at stool or the trauma exerted by the examining finger by accident or intent.

Since there are very definite anatomical spaces where peri-prostatic infection may result in abscess formation, care is always necessary in investigating these spaces when a peri-prostatic abscess is drained.

Sixteen of Kretschmer's cases were operated upon with no operative mortality. In 1, an opening was made into the rectum, and in another, into the ischio-rectal fossa into which the abscess pointed. In the remaining 14 the perineal route was used. The perineal route is the route of choice. Care is necessary that a second abscess is not left behind.

Waiting for spontaneous rupture of the abscess should be discouraged as this time is necessarily taken at the expense of prostatic tissue; furthermore, the drainage from a spontaneous rupture may be insufficient so that a chronic discharge or future abscess formation will result.

The after-care consists in routine local treatment until the prostate strippings are free from pus.

HARRY CULVER.

Deaver, J. B., and Herman, L.: The Prognosis in Prostatectomy. *Arch. Surg.*, 1921, ii, 231.

Deaver and Herman discuss, on the basis of statistics, the selection of cases for operation and the standardization of the mechanics involved in prostatic surgery so that the primary mortality and the postoperative morbidity will be reduced to the minimum. They believe that the two-stage operation is a decided step in advance in the treatment of certain cases, but question the advisability of its routine adoption.

The indications for the two-stage operation are: (1) cases of acute retention due to prostatic hypertrophy which are uncomplicated by stricture of the urethra, (2) most cases in which there are great quantities of residual urine; (3) all cases in which there is severe infection of the bladder; and (4) the small group of cases in which drainage is necessary on account of bleeding from the prostate.

In the authors' opinion this operation is a life-saving measure not only in the group of cases in which palliative treatment is urgently needed and the catheter is ill-borne, but also in many cases in which the catheter has been used with apparent success in the past. Preliminary cystostomy is, without doubt, the most efficient means of preventing a kidney breakdown and the spread of septic infection. Moreover, it minimizes hemorrhage following the enucleation of the prostate and thus promotes rapid convalescence.

The primary mortality rate is slightly less following perineal prostatectomy than following the suprapubic operation. The primary mortality rate is dependent more on the care with which cases are selected for operation and the thoroughness with which the pre-operative treatment is carried out than on the type of operation selected or the skill of the surgeon who performs it. The difference in the operative mortality following the two types of operation is only slight. The suprapubic operation is a much safer procedure for the occasional operator, however, than perineal prostatectomy. In the authors' series of selected cases the death rate following perineal operation was 10.9 per cent, while that following the suprapubic operation was 6.9 per cent.

In the cases reviewed the chief causes of death immediately following prostatectomy, in the order of frequency, were: uræmia, 39; hæmorrhage, 32; shock, 18; sepsis, 13; cardiovascular disease, 10; pyelitis and pyonephrosis, 8; pulmonary complications, 6; asthenia, 7; and embolism, 5.

These figures indicate that 69 per cent of all deaths following prostatectomy are due to uræmia, hæmorrhage, shock, or sepsis. In almost all of the larger series of collected statistics, whether dealing with suprapubic or perineal operation, uræmia is placed at the head of the list of factors causing death.

The late results of 372 perineal prostatectomies and 814 suprapubic prostatectomies are summarized as follows:

Seventy and 76 per cent of the the series of patients respectively are reported as being com-

pletely cured. Seventy-eight per cent of those who were subjected to perineal prostatectomy and 79.4 per cent of those who were subjected to suprapubic prostatectomy were alive and free from bladder symptoms two years after the operation.

In estimating the prognosis in any given case of prostatic hypertrophy the physical condition is of major importance and the average result of the operation is of only relative importance. However, if the patient desires statistical information, he can be assured that his chances for recovery from the operation, in company with that of fellow sufferers, are more than 90 per cent and that the probabilities of continued life and entire comfort are more than 70 per cent.

H. A. McKNIGHT.

Rosencrantz, H. A.: Prostatectomy Cases, Post-operative Treatment. *California State J. M.*, 1921, xix, 107.

Rosencrantz considers postoperative hiccough as a potentially serious condition which should be checked promptly before the pernicious stage has been reached. He considers the most probable cause to be pyelonephritis which produces a reflex or a toxæmia, usually without uræmia. Some hiccoughs he attributes to acute irritation of the kidney and irritation of bacterial toxins rather than to that produced by the products of uræmia. His plan of treatment consists of prohibiting all medicine and food by mouth, stomach washings with $\frac{1}{2}$ per cent soda bicarbonate solution two or three times daily, hot compresses, the administration of 2,000 to 3,000 c.cm. of a $\frac{1}{2}$ of 1 per cent soda bicarbonate plus 5 per cent glucose solution during each twenty-four hours, preferably by rectum by the drip method, 5 gr. of chlorotone, atropine in $\frac{1}{100}$ gr. doses every two hours for four injections, and morphine.

Rosencrantz insists on a drastic initial purgative at the beginning of pre-operative treatment, the

cathartic being given in the morning before breakfast and followed by the administration of a cup of flaxseed tea every other morning an hour before breakfast. On the morning of the day before the operation the patient should receive a dose of castor oil, and at night, an enema. On the following morning the bowels should be flushed again.

Diarrhœa can be checked only with laudanum; bismuth has no effect. The author regards this condition as a toxæmic diarrhœa.

Rosencrantz prefers spinal anæsthesia because it lessens the danger of hæmorrhage and uræmia, gives the most complete relaxation, does not irritate the kidneys, and prevents ether pneumonia.

The causes of a rise in temperature are constipation, infection in the prevesical space, pyelonephritis, and a flaring up of some old focus of infection.

The author urges extreme care to remove not only the tumor completely but also the dilated prostatic urethra above the verumontanum to avoid pouching; drainage of the bladder by the urethra as well as the suprapubic wound; the removal of all focal infections before operation to prevent flare-ups; the drinking of large quantities of water; and the avoidance of the frequent application of silver nitrate or tincture of iodine to the suprapubic wound as it retards healing.

The one-stage operation is preferred by Rosencrantz in most cases, except when a bladder calculus or acute retention is present. Drainage of the prevesical space is now a routine measure. He has abandoned operating upon cases of cancer of the prostate. When the prostate is unusually large and a severe hæmorrhage occurs at operation, he packs the entire bladder very tightly with a large dry roll and does not insert a drainage tube. Suture of the bladder wall he regards as dangerous.

LOUIS GROSS.

SURGERY OF THE EYE AND EAR

EYE

Pacheaca-Luna, R.: Contribution to the Study of Onchocercosis. *Am. J. Ophth.*, 1921, iv, 175.

The term "onchocercosis" is applied to a new nosological entity which is characterized by the formation of a distinctly limited subcutaneous tumor containing a filarial *Onchocerca* and giving rise chiefly to disturbances of the eye.

Robles was the first to discover that the disease known as "coast erysipelas" is due to this filaria and to recognize the intimate relationship between the parasite and the clinical symptoms.

Onchocercosis exists in an endemic form in an extensive strip of land along the coast of the Pacific in Guatemala which has an altitude of 2,000 to 4,000 feet. This species of filaria is regarded as entirely new, differing in many points from those already known. The tumors are found most frequently in the cellular tissue underneath the scalp and are distinguished from sebaceous cysts by their location, consistency, size, and form. In size and appearance they greatly resemble a bean. They can be dissected easily as they do not adhere to the neighboring tissues. The carrier of the filaria has not been discovered but there are reasons for believing that the inoculation is made by the bite of certain blood-sucking insects.

As the eye has been found constantly affected in hundreds of patients it is logical to assume that the parasites exercise their action by means of a secretion which is carried in the circulation to the whole organism. The eye lesions are usually appreciable but in some cases not recognizable.

Extra-ocular manifestations are noted principally in the skin of the face as "coast erysipelas" which shows eruptions more or less acute resembling the streptococcus erysipelas but differing from it in that there are no changes in the color of the skin or local differences of temperature.

The subjective symptoms are photophobia, a sensation of drawing as though the distended skin were about to burst, and local irritation and itching.

The ocular lesions are classified as: (1) keratitis punctata superficialis, horizontal, marginal, or inferior; (2) iritis fibrinosa with or without disturbance of the pupil, and (3) amblyopia without other appreciable symptoms. The author emphasizes the fact that pure forms are not found and always more than one tissue of the eye is affected.

Superficial horizontal punctate keratitis, the most common lesion, occurs in young subjects. The whitish dots in the membrane of Bowman are arranged in the horizontal meridian and are grouped densely near the edge and less densely toward the center, a characteristic of onchocercosis.

In marginal superficial punctate keratitis or microcornea the diameters of the transparent cornea are reduced to 8 or 9 mm. due to a compact marginal dotting of the same color as the sclera with no appreciable line of demarcation. As the lesions do not advance to the center of the cornea, visual acuteness is not diminished.

In fibrinous keratitis organization of the fibrin in the lower portion of the anterior segment of the eye pulls the pupil downward so that it often reaches the limbus. Because of the changes in the optic nerve and retina iridectomy does not improve the vision.

In the amblyopic form no other phenomenon than gradual loss of sight occurs and not the least change is discernable in any structure of the eye. This form affects adults about 40 years of age and vision increases considerably as soon as all the tumors are removed.

S. S. HOWE.

Poyales, F.: The Transplantation of Buccal Mucosa and Fat into the Conjunctiva in the Treatment of Trachoma (Injertos de mucosa y grasa bucal en la conjuntiva como tratamiento del tracoma). *Prog. de la clín.*, Madrid, 1921, ix, 68.

After reviewing briefly the etiology, pathology, and sequelæ of trachoma Poyales discusses the surgical methods of treating the condition. These may be divided into three groups. The first group include methods which tend to destroy the granulations; the second, those which tend to modify or deal with the sequelæ; and the third, those which deal with the prevention of corneal complications.

Poyales presents a new operation the chief purpose of which is the prevention of pannus. This procedure consists essentially of the transplantation of a triangular piece of mucosa and fat from the upper lip to the upper portion of the conjunctiva adjoining the limbus. It is performed in the following steps:

1. After cocaineization of the eye and the part of the lip to be used for the graft, a triangular flap of mucosa and fat is dissected up from the lip, one edge being left attached. The fat is then scraped from the flap, except for a small button in the center.

2. A triangular flap of bulbar conjunctiva of similar size is resected, the base of the triangle being at the corneal limbus. The dissection is carried down so as to remove some of the corneal epithelium.

3. One needle of a double-armed suture is passed through the sides of the conjunctival triangle and the other through the edge of the graft of mucosa and fat, the latter still being attached. The two sutures having been placed, the graft is cut loose and drawn up into the conjunctiva and tied.

The author claims this operation prevents the progress of the disease with the formation of pannus

because the foreign membrane acts as a barrier to the advance of the trachoma and the button of fat in the graft elevates it, thereby preventing the granulations of the lid from coming into contact with and rubbing against the cornea.

S. A. SCHUSTER.

Butler, T. H.: Some Examples of Idiosyncrasy.
Brit. J. Ophthalm., 1921, v, 118.

A nurse consulted the author because of an acute conjunctivitis which came on from one to two hours after she had made a linseed poultice or had handled the seed in any form. A week was required for recovery. In another case urticaria developed after the handling of linseed.

In a third case severe eczema of the lids was caused by yellow oxide of mercury ointment and rapidly cleared up when the application of the ointment was discontinued.

The use of 1 per cent holocaine by an elderly woman caused intense pain with vomiting, diarrhoea, and conjunctivitis some hours later.

In a fifth case a solution of cocaine and homatropine to which chloretone had been added to prevent the growth of molds produced great irritation of the eye which was ascribed to the action of the chloretone.

The sixth case was that of a man, aged 70, who was under treatment for glaucoma. This patient became dizzy and faint when eserine was used immediately after cocaine but suffered no ill effects when eserine or cocaine was employed alone.

S. S. HOWE.

Arganaraz, R.: Injections of Milk in Grave Suppurative Processes of the Eye (Las inyecciones de leche en los procesos supurativos graves del ojo).
Semana méd., 1921, xxvii, 57.

The use of injections of milk is gaining in popularity in ocular therapeutics in South America. This new treatment has given surprising curative results in the most severe suppurative lesions of the eye. Arganaraz reports two cases.

The first case was a penetrating wound of the eyeball which resulted in a serpiginous ulcer of the cornea complicated by a severe panophthalmitis. Intense palpebral oedema and tumefaction of the lids developed and the margins were agglutinated with muco-pus. The conjunctivæ were injected and the corneas chemotic. Hypopyon was present, the iris was discolored, and the pupils were contracted and fixed. Smears from the conjunctival sac showed pneumococci and bacillus xerosis. At the first consultation, six days after the receipt of the injury, the treatment prescribed was as follows: (1) instillations in the eye every two hours of a 2 per cent solution of optochin, (2) ocular irrigation with a disinfecting solution, (3) hot fomentations, (4) atropine and iodoform in pomade, 1 and 2 per cent respectively, and (5) a purgative, liquid diet, and rest in bed.

During the following four days there was no improvement and several of the symptoms became

aggravated. At this time the first injection of 10 c.cm. of sterile milk was given in the gluteal region and followed two days later by another similar injection. The day after the second injection there was marked improvement in both the local and the general symptoms. A third injection of 10 c.cm. was then given and one week later the eye presented almost a normal appearance. The corneal wound had cicatrized, the ocular media were transparent, and ophthalmoscopic examination of the fundus was negative.

The second case was a case of orbital cellulitis, the etiology of which it was impossible to determine. The treatment consisted of the application of fomentations locally, rest, purgation, and light diet. As during the two succeeding days no improvement was noted, injections of milk were again employed. Three injections of 10 c.cm. each were given on alternating days. Three days after the last injection the eye presented a normal appearance and all symptoms had disappeared.

Most authorities agree that the quantity of milk injected should not be over 10 c.cm. given daily or every other day. Prolonged boiling or heating to a temperature above 120 degrees reduces the therapeutic power. Only fresh milk previously heated to boiling for four minutes should be used. Three to five injections are sufficient in most cases.

This therapy has not been employed in simple ophthalmia, although it might be advantageous. Neither have there been any reports of its use in chronic inflammations of the iris and ciliary body. In trachoma its results have not been favorable. The most beneficial effect has been noted in acute suppurative processes and ulcerations of the cornea.

W. R. MEEKER.

Brandt, F. H.: Operative Procedure in Chronic Persistent Obstruction in the Lachrymal Sac.
Laryngoscope, 1921, xxxi, 191.

The operation of dacrycystorhinostomy essentially as done by West is described. The author first passes a probe through the inferior punctum into the lowest part of the sac and forces it through the lachrymal bone into the nose. At this point, to obtain a landmark, he removes an 8-mm. flap of mucous membrane and then removes the probe. The nasal duct should be cut across at its junction with the sac, and the edges of the bony opening, which should be larger than that in the sac, should be made as smooth as possible in order that union of the tear sac with the mucous membrane of the nose may more readily occur and afford permanent drainage.

S. S. HOWE.

Feingold, M.: Mooren's Ulcer of the Cornea.
Am. J. Ophthalm., 1921, iv, 161.

In the case reported the long and progressive process in the cornea, the severe pain, and the histologic findings leave hardly any doubt as to the correctness of the classification of the case even though perforation resulted, an occurrence which is not regarded as characteristic of Mooren's ulcer.

A careful histologic examination of the eye was made and photomicrographs of sections are reproduced. One new histologic finding was an abundant number of giant cells in the margin of beginning ulceration which indicated scavenger function.

Repair is initiated by the growth of the conjunctiva to the floor of the ulcer as soon as the necrotic material is cast off. Relapses are due to the migration of the advancing conjunctiva to the cornea before the ulcer margin is cleared of all necrotic material and micro-organisms by the giant cells.

No histologic characteristics can be found in the cases so far reported, or in this one, to explain why this disease only rarely destroys the deeper layers of the cornea. Deep ulceration is probably due to secondary infection.

Thorough destruction of all invaded cornea and sclera is suggested in the treatment. Even the portions already covered by conjunctiva and granulation tissue must not be spared if all foci for further spread of the disease are to be destroyed.

S. S. HOWE.

Danis, M.: Proliferating Chorioretinitis. *Am. J. Ophthalm.*, 1921, iv, 153.

The author reports a case of this rare condition in which the eye was injured by a stone with immediate and complete loss of vision when the subject was 7 years of age. At the age of 25 a grayish, opaque, mamillated, and somewhat club-shaped mass was seen protruding forward in front of the optic papilla. Behind the mass the posterior pole of the eye was slightly excavated, and around the papilla was a circle of choroiditis. The central vessels, of normal caliber, left the excavation and ascended beside the whitish mass before spreading out upon the retina.

This case presents all the characteristics following injuries of the orbit by war projectiles which have been described by Lagrange, as there was organization of a choroidal hæmorrhage following rupture of the choroid and retina which was marked by proliferation of the connective tissue of the choroid.

With regard to the mechanism of the injury Gonin is quoted as stating that a blow on the eye

may cause a partial avulsion of the optic nerve indirectly by sharply rotating the globe and that exaggerated flexion may produce a rupture of the membranes at the border of the optic disc.

According to Lagrange, these lesions may be due to concussion of the bones of the face. "The eye is lifted up, shaken, in the same manner as a ship is shaken by a ground swell arising under its bottom."

The localization of the lesions at the macula and posterior pole is due to the fact that the macular region is the most delicate and most liable to injury and when the eye is shaken it is held back, twitched, by the optic nerve firmly fastened at the apex of the orbit, these motions acting chiefly on the posterior pole where they produce ruptures and hæmorrhages.

S. S. HOWE.

EAR

Dean, L. W., and Bunch, C. C.: The Results Obtained from One Year's Use of the Audiometer in the Otological Clinic. *Laryngoscope*, 1921, xxxi, 137.

From one year's use of the pitch range audiometer the authors are convinced that it gives evidence hitherto unobtainable and presents evidence obtained by other methods more definitely and satisfactorily. The results of the tests are easy to interpret and may be verified immediately. The presence of unsuspected gaps and islands in the range tested is easily ascertained.

Two hundred cases were tested and checked with tuning fork tests made by two different persons. In a number of cases the results of one of the two examinations with the tuning forks did not agree with the findings of the audiometer. When these cases were rechecked by Dean the audiometer findings were found to be correct and the tuning fork tests at fault.

The time necessary for the complete examination with the audiometer averages fifteen minutes. This includes the time required for such oral instructions as are necessary and for writing up the record. The authors are convinced of the accuracy and reliability of the audiometer and present several charts comparing its records with those of other clinical tests.

O. M. ROTT.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Sheehan, J. E.: Gillies' New Method in Giving Support to the Depressed Nasal Bridge and Columella. *N. York M. J.*, 1921, cxiii, 448.

Gillies' new method in giving support to the depressed nasal bridge and columella as described by Sheehan consists in implanting a piece of chondral cartilage with or without perichondrium. The cartilage is obtained as follows:

The costal synchondroses are approached by a vertical incision 15 cm. long made over the cartilages of the seventh, eighth, and ninth ribs so that its center is opposite the junction of the seventh and eighth ribs and it extends through the rectus muscle. The rectus muscle is then widely retracted. This area is chosen because the ribs here expand into a wide plaque and a piece of cartilage of any desired size and shape may be obtained. The cartilages should be taken from the right side of the chest to avoid the possibility of injuring the pericardium by causing pleurisy followed by pericarditis and the possibility of concussion of the heart. The cartilage may be removed in part or throughout its entire thickness. A scalpel, a sharp undermining elevator, and a blunt retractor are the only instruments necessary. The chest wound is sutured by an assistant and the thorax is strapped as for a fractured rib.

Before beginning any surgical procedure on the nose a photograph should be taken and a plaster mold made.

In making the columella incision, a vertical incision is made near the junction of the skin and mucous membrane of the columella, carried through its whole length, brought forward around the columella at its base, and then extended upward to the opposite side. This having been done, the columella is hooked backward and held out of the way by an assistant. The septal mucous membrane on both sides is freed for a short distance for the purpose of securing a firm hold and accurate approximation when suturing. The skin over the depressed bridge is undermined to the infraglabellar region to make a bed for the graft.

The graft is then properly shaped to the desired pattern and a triangular piece is excised at its proximal end so that it may be bent. The perichondrium over the bridge of this excised triangular piece is left intact to act as a hinge; the rest is removed. The graft is inserted in the nose and the lower part is bent to a right angle, its end fitting into the loose tissues at the top of the philtrum of the columella. All septal cartilage is removed from the columella and the edges and center are so trimmed that they envelop the graft. The wound is closed

with fine horsehair, care being taken to secure accurate approximation of the septal and columellar flaps.

O. M. ROTT.

Mullin, W. V., and Ryder, C. T.: Studies on the Lymph Drainage of the Accessory Nasal Sinuses. *Laryngoscope*, 1921, xxxi, 158.

Lymphatic absorption from the antrum, whether of bacteria or of inert substances, occurs by the way of the submaxillary and internal jugular nodes (the latter including the analogue of the retropharyngeals in man) to the lymph ducts, the great veins, the right heart, and the lungs. Substances reaching the lungs may of course pass on to the left heart and the general circulation. They may also be taken up by the pulmonary lymphatics and reach the bronchial nodes.

Absorption from the tissues of the face in the antrum region and from the palate occurs by the same route.

The subparotid and retrosternal nodes may sometimes be reached by absorption from the antrum and neighboring tissues.

Absorption from the frontal sinus seems to follow the same course as absorption from the antrum. From the scalp over the sinus absorption usually reaches the subparotid and postauricular nodes.

Absorption from the meninges reaches the internal jugular and probably also the submaxillary nodes.

There is little if any absorption from the uninjured mucosa of the nasal fossæ.

Lymphatic drainage is widely regional. Anastomosis from node to node and from side to side is free. Therefore it is not always possible to fix on a single node or group of nodes as the certain point of election for metastasis from a given region.

With respect to lymphatic function as well as anatomically the lining membrane of the nasal fossæ and accessory sinuses is a continuous whole, and infection at one point can probably be conveyed by the lymphatics to practically any other point.

There are lymphatics penetrating the posterior bony wall of the frontal sinus, and under exceptional conditions of pressure in the sinus these may carry substances from the sinus to the dura over the frontal lobe of the brain.

The tonsils do not appear to receive drainage from any area beyond their own surface with its crypts.

Drainage of the sinuses into the upper air passages renders the bronchi and lungs liable to infection by inhalation, and this factor may be as important as lymphatic metastasis in accounting for the clinical association of sinus disease with bronchopulmonary disease, though in sinus cases which do not drain it seems to be excluded.

The authors have not found any direct lymphatic communication between the plexus and nodes of the head and neck and the lungs and pleura. Theoretically, on the basis of development, connections may be formed and occasionally may even function, but this seems a far-fetched explanation of lung metastases from infections of the nose, sinuses, and throat. The obvious and easily demonstrated routes are: (1) the lymphatic, down the deep cervical chain and by way of the ducts and veins to the right heart and thence directly to all parts of the lungs, and (2) the bronchial, by inhalation of infectious material escaping into the nose.

Throughout the investigation, and especially in the experiments on the frontal sinus in which an incision was made, the possibility of aspiration of the injected substances by injured veins was not excluded. However, the findings considered as a whole and the fact that the injury inflicted on the vessels by the technique used in the antrum series was extremely slight make it almost certain that venous aspiration was a negligible factor.

While the research reported warrants conclusions only with regard to the animals used, the rabbit and cat, the authors have been struck repeatedly by close parallels between their experimental findings on the one hand and clinical and anatomical observations on the other. They are therefore convinced that further study will establish other parallels and that most, if not all, of their conclusions can be proved to apply to the human subject. O. M. ROSE.

Olitsky, P. K., and Gates, F. L.: Experimental Studies of the Nasopharyngeal Secretions from Influenza Patients. II. Filterability and Resistance to Glycerol. *J. Exper. M.*, 1921, xxxiii, 361.

The authors' purpose in this paper is to define more clearly the nature of the peculiar or active substance responsible for the effects produced in rabbits and guinea pigs by nasopharyngeal secretions obtained from cases of uncomplicated influenza and to distinguish it from bacteria of the ordinary species.

Before presenting what they regarded as the decisive experiments, all of which were made on rabbits and guinea pigs, they explain briefly a series of tests carried out on monkeys, chiefly *Macacus rhesus*, in which the nasopharyngeal secretions from cases of uncomplicated influenza collected from twelve to forty-eight hours after the onset of the symptoms were filtered through Berkefeld V or N candles and injected intratracheally or subconjunctivally, or by both routes. In some instances the material was injected as it came from the filter. Occasionally it was concentrated at a low temperature *in vacuo* according to the method of Amoss and Taylor.

All these experiments resulted negatively in that no effects were observed which were not obtained also from similarly treated secretions from persons believed not to have suffered from influenza.

The findings of the experiments on rabbits and guinea pigs are summarized as follows:

An active transmissible agent present in the nasopharynx in early cases of influenza was found to produce definite and characteristic clinical reactions and pathologic effects in rabbits as already described in an earlier publication.

The agent as it existed in the nasopharyngeal secretions in man and in the lungs of rabbits injected with the human secretions passed through Berkefeld V and N candles.

The filtered material produced the same effects on the circulating blood and the lungs of rabbits as the unfiltered material.

The peculiar effects described as arising in the inoculated rabbit were induced also in guinea pigs inoculated with the agent.

The agent responsible for the reaction on the blood and the lungs of rabbits withstood the action of glycerol in a sterile 50 per cent solution for periods up to nine months, but whether it could withstand much longer contact with the chemical or not was undetermined. In two experiments after contact lasting for from ten to twelve months, however, it induced no observable changes in the blood and lungs of rabbits. G. E. BEILBY.

Olitsky, P. K., and Gates, F. L.: Experimental Studies of the Nasopharyngeal Secretions from Influenza Patients. III. Studies of the Concurrent Infections. *J. Exper. M.*, 1921, xxxiii, 373.

In a previous article the authors reported the effects produced in the lungs and blood of rabbits by the intratracheal injection of the nasopharyngeal secretions from patients in the early stages of uncomplicated epidemic influenza. These effects they traced to a living substance not of the nature of ordinary bacteria. Occasionally, however, though rarely, ordinary bacteria were discovered in the lungs in the course of the experiments and in such cases the lesions of the lungs and the composition of the blood were very different. As the authors suspected a relationship between the active substance giving rise to the peculiar effects observed in the lungs and blood and the etiological agent of influenza, and since epidemic influenza in man so commonly predisposes to a variety of secondary pulmonary infections, they deemed it advisable to study also the concurrent ordinary bacterial invasions.

The subject was approached from two points of view. First, the circumstances under which ordinary bacteria accidentally invaded the lungs in the course of the transmission experiments were considered, and second, concurrent infections were induced experimentally in order to imitate in the rabbit the operation of the predisposing influences of influenza leading to secondary pulmonary affections.

The unfiltered or filtered nasopharyngeal secretions of early cases of epidemic influenza were injected into the lungs of rabbits by way of the

trachea. Where unfiltered secretions were used bacteria present in the nose and throat were carried into the lungs, but they often disappeared or were eliminated in the course of subsequent transmission experiments.

The kinds of bacteria and the number of times they were observed in the various rabbit and guinea-pig passages were as follows: Pneumococcus Type IV, 11; Pneumococcus Type II atypical, 3; gram-negative hæmoglobinophilic bacillus, 2; bacillus pyocyaneus, 2; bacillus bronchisepticus, 2; micrococcus catarrhalis, 1; bacillus coli communis, 1; streptococcus viridans, 1; streptococcus hæmolyticus, 1; gram-negative, slender, spore-bearing bacillus, 1; and streptothrix, 1.

The widespread impression that the inciting agent of influenza, whatever it may be, renders the lung structures more vulnerable to many bacteria ordinarily present in the nasopharynx in health suggested that possibly the influenzal agent under consideration had a similar effect. A series of experiments was therefore carried out to test this point. The first step was to determine the effects of pure cultures of the several bacteria alone, and the second, to ascertain whether lungs already damaged by the influenzal agent would react differently to the bacterial inoculations.

These experiments showed that the intratracheal injection of the influenzal agent in rabbits exerted an influence on the pulmonary structures of these animals of a nature which encouraged the invasion of the lung and the subsequent multiplication there, with lethal outcome, of such bacteria as the pneumococcus, streptococcus, and bacillus Pfeifferi which otherwise, in the doses employed, were without marked effect. The control experiments showed that the injection of normal rabbit lung exerted no such predisposing influence. G. E. BEILEY.

THROAT

Williams, F. H.: The Treatment of Hypertrophied Tonsils and Adenoids by Radium. *Boston M. & S. J.*, 1921, clxxxiv, 256.

Williams gives a preliminary statement concerning the action of radium on hypertrophied tonsils and adenoids, but no definite data of results. He used 50 mg. of radium bromide in a flat container, filtering the rays by 0.83 mm. of aluminum held directly against the tonsil. The radium was withdrawn every few minutes and the total exposure was fifteen minutes.

Reference is made to Murphy's article "Induced Atrophy of Hypertrophied Tonsils by the Roentgen

Ray," but there is no definite statement concerning the comparative value of operation and the use of the roentgen ray or radium. O. M. RORT.

MOUTH

Cameron, A. L.: Lipoma of the Corpus Adiposum Buccæ: A Review of the Literature and Report of a Case. *J. Am. M. Ass.*, 1921, lxxvi, 778.

Cameron's review of the literature shows that lipomata of the corpus adiposum buccæ are most unusual. According to Lexer, lipomata of the face arise as a rule from the sucking pad.

Scammon, in 1919, published an exhaustive article on the development of the corpus adiposum buccæ. He described it as "a specialized and sharply circumscribed mass of adipose tissue which lies in the cheek partially wedged between the masseter and buccinator muscles, and covered externally by the superficial fascia of the face and the zygomatic muscle. Posteriorly it is connected by a stalk with a much larger fat mass, termed by Forster the "corpus adiposum malæ," which is located between the temporal and the pterygoid muscles, and which possesses a superficial process extending over the outer surface of the temporal muscle beneath the temporal fascia." At birth the sucking pad is a prominent structure of the cheek. Scammon found it also at autopsy in 34 of 42 bodies of persons between the ages of 20 and 60. Cameron collected 15 cases from the literature. Of these, only 4 were reported in the English literature. The 15 cases are summarized. The typical case revealed a soft, lobulated, elastic and movable tumor ranging in size between that of a chestnut and that of a man's fist, situated at the site of the corpus adiposum buccæ. Most of the tumors were removed through a mucosal incision. Only 3 were congenital. The ages of onset in the remaining cases ranged from 10 to 62 years. The right side of the face was involved in 9 cases and the left in 3. In 3 case reports the side was not stated.

The author's case was that of a boy aged 14 who had a tumor of the right cheek which had been present as long as the patient could remember but had been noticeable for only two years. The tumor was one and one-half times the size of a hen's egg and situated over the buccinator and anterior part of the masseter muscles. When the mouth was opened it bulged into the oral cavity. It was soft, lobulated, painless, and freely movable. It was removed through a mucosal incision and found to be a bilobar growth weighing 36 gm. Microscopically it was a lipoma and resembled in every detail a hypertrophied corpus adiposum buccæ. FRENCH K. HANSEL.

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SURGERY OF THE EYE AND EAR

Eye

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

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INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1921

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Budde, W.: Plastic Reconstruction of Ducts Lined with Mucosa. I. The Male Urethra. II. The *Œsophagus* (Zur Frage des plastischen Ersatzes schleimhautbekleideter Röhren: I. Urethra virilis. II. *Œsophagus*). *Deutsche Ztschr. f. Chir.*, 1921, clxi, 1.

Plastic reconstruction of the urethra in hypospadias and epispadias must always be preceded by straightening of the penis with the possibility of a further backward displacement of the opening of the urethra. The urine should be kept from the field of operation by suprapubic drainage of the bladder by means of percutaneous puncture with a trocar; perineal urethrotomy offers greater advantages only when there is weakness of the sphincter. For a few days a retention catheter may be used if it seems that the plastic oedema caused by it will bring about a better adaptation of the ends of the urethra.

There are four surgical methods of treating defects of the urethra. The first, in which no suturing is done and a bougie and catheter are used until regeneration of the urethral epithelium takes place, can be applied successfully only to cases in which suppuration has not persisted very long and there is no great degree of injury to the tissues. In defects caused by operation there should be little or no drainage, and whenever possible a bridge of mucous membrane should be preserved.

The second method, covering the defect by mobilization of the stump and circular suture, is the method of choice and is useful both in the anterior and posterior parts of the urethra. Traumatic stricture is easier to remedy than the gonorrhœal form because, though the surrounding scar is dense and its transverse diameter is considerable, it is not so long as the gonorrhœal stricture. In the traumatic form, therefore, the cicatricial callus can generally be removed entirely, while in the gonorrhœal form, though the surrounding cicatricial tissue can and

must be radically removed, the normal lumen of the urethra must be preserved throughout, even though some cicatricial tissue remains adherent to it, as otherwise the defect created would be too long. By the method described, gaps of 3 to 4 cm. may be bridged in this way in the anterior portion and defects up to 9 cm. long in the posterior portion.

The third method consists of the use of flaps. Budde distinguishes between flaps which are attached to the original site by only a narrow pedicle and those which have a broad base such as were used in the old Thiersch-Duplay plastic operation. He prefers the latter because of their good nutrition. He has devised two methods of flap operation, or rather, has modified earlier methods. One is used in plastic reconstruction of the penile portion of the urethra in hypospadias. The scrotum is shaved and the position of the penis corrected. The channel and mouth of the urethra are freshened, a rectangular flap corresponding to the line of the urethra is cut from the scrotum, and the mobilized edges of this flap are sewed over a catheter to form a tube. The central end of the tube is sutured to the old opening of the urethra. The tube is fastened with buried sutures in the channel of the urethra and the wound is closed by uniting the cut edges on the penis and scrotum so that the newly-formed urethra is buried. The scrotum is freed from the penis. The other method is used on the posterior urethra. A tube formed of skin from the scrotum is left attached by a broad pedicle to the raphé of the scrotum and forced under a bridge of perineum into the defect where it is sutured around a retention catheter. In the reconstruction of the intrathoracic *œsophagus* the author recommends a similar method which is based on his studies of the cadaver.

The fourth method of reconstructing the urethra consists of the transplantation of tubes made of Thiersch flaps, veins, fascia, or the appendix, which serve essentially only as conductors for the regenerating mucous membrane. The results of this method

are not nearly so dependable as those of the third method as in both traumatic and inflammatory defects infection of the wound occurs very readily. The procedure has possibilities, however, in defects at the mouth of the urethra where a transplant has good nutritive conditions.

SEEVERS (Z).

Propping, K.: The Treatment of Wounds with Unbleached Gauze (Ueber Wundbehandlung mit nicht entfettetem Mull, (Rohmull, Rohgaze). *Muenchen. med. Wchnschr.*, 1921, lxviii, 299.

The experiments of Sachs on the use of unbleached gauze to stop hæmorrhage induced the author to employ this gauze in the treatment of wounds. He found that tampons of unbleached gauze adhered less than those of hygroscopic gauze and therefore caused the patient less pain when they were removed. The easier removal of the tampons lessened the danger of secondary hæmorrhage. The healing of the wound is not interfered with and the gauze can be left in place from four to seven days. In Propping's opinion the pressure of the secretion is the force which drives the wound fluid through the meshes of the unbleached gauze and the capillarity of the bleached gauze acts unfavorably on drainage. When there is a tendency to bleeding, as in gall-stone surgery, prostatectomy, and hæmophilia, he recommends mechanical compression with unbleached gauze. The distribution of the blood stream into numerous very small channels and the slowing of the current brought about by it is said to hasten clotting.

HOHMEIER (Z).

ANÆSTHESIA

Rowbotham, E. S., and Magill, I.: Anæsthetics in the Plastic Surgery of the Face and Jaws. *Proc. Roy. Soc. Med., Lond.*, 1921, xiv, Sect. Anæ., 17.

This article is based on war injuries and represents about 3,000 anæsthesias induced by the authors at Queen's Hospital, Sidcup. With the exception of the cutting of grafts from the ribs and limbs, the operative work was confined entirely to the face and jaw region.

On the whole, there were few chest complaints, but a considerable number of the patients showed some degree of cardiac dilatation and irregularity. This, however, might have been due to excessive cigarette smoking. Nearly all of the men had had several operations before, some as many as twenty-five or thirty. The average was nine or ten. With the exception of those who had been severely burned—a type of patient who stands operation badly—and those in whom the function of mastication was lost and whose nutrition was therefore poor, the long and repeated operations were remarkably well borne.

The chief difficulty during anæsthesia was always that of maintaining a proper airway. Loss of part of the mandible, scarring and adhesions around the tongue, microstomia, trismus, and splints or other

apparatus fixed in the mouth were the chief obstacles to be circumvented.

In far the greater number of cases the authors preferred to administer the anæsthetic by intratracheal insufflation. The safety and freedom from airway troubles in this method, however much the surgeon moves the patient's head or however awkward his position, make it invaluable in plastic work. It was found that in many cases there was some resistance to expiration. A tube passed down by the side of the catheter almost as far as the glottis obviated this and allowed proper collapse of the chest, thus aiding circulation and preventing unnecessary strain on the heart.

In operations upon the mouth and lips the anæsthetic was administered by the nose. The mouth or pharynx was usually packed with gauze to prevent the blood from trickling or bubbling up and obscuring the view.

The endopharyngeal insufflation of ether or gas-oxygen-ether proved useful in cases of trismus in which the mouth could not be opened sufficiently to admit a laryngoscope and those in which the jaws were splinted up for bone grafts. A medium-sized nasal tube connected with the anæsthetic supply was passed into the pharynx through one naris. If the operation was apt to cause bleeding into the mouth, a larger sized tube was passed through the opposite side of the nose to provide a return airway and the back of the mouth was packed with gauze. Ether vapor or gas supplied to the patient in this way should have a safety valve in its course as in intratracheal insufflation as any obstruction to the return airway means a decided increase of pressure in the air passages.

Intratracheal insufflation is even more useful by the nasal route than by the oral route. It assures freedom of airway and prevents the entrance of blood into the trachea. For all intra-oral operations it was combined with a return nasal airway through the other side of the nose. When the pharynx could not be conveniently packed the intermittent use of a suction apparatus attached to the return airway was found to be of great advantage in keeping the field clear for the surgeon. The details of the method of passing the catheter are given.

In many of the cases the injuries about the mouth were such as to render the maintenance of the airway difficult after the patient was returned to the ward. It was sometimes sufficient to leave the catheter in the trachea until he began to cough it out; in other cases a long piece of tubing passed down beyond the base of the tongue answered the purpose. In this respect the superiority of gas-oxygen-ether over ether alone was evident on account of the very rapid return of the reflexes. It is important to clear the pharynx of mucus and blood by careful swabbing before the patient leaves the operating room.

Of the general anæsthetics the choice lay between ether and gas-oxygen-ether. Chloroform was

practically never given. The patients usually did well on ether, but when gas-oxygen-ether was given their general condition both during and after the operation was decidedly better. The early return of the reflexes and the almost entire absence of vomiting also make gas-oxygen-ether highly preferable for such cases. When the surgical condition permitted, it was not uncommon for the patients to be up and about the day after a long gas anæsthesia.

Rectal oil ether was at one time used largely for these cases, but was abandoned, not only because of the uncertainty of its effects and its tedious preparation, but because of certain difficulties of airway.

Of the methods of administration intratracheal insufflation is by far the most valuable. It was used in nine out of every ten cases. The freedom of airway reduces the chances of anæsthetic shock to a minimum, and the lack of respiratory effort is no doubt a material factor in supporting the patient's strength. Its easy control without in any way disturbing the surgeon is also a great advantage in these essentially aseptic operations. For selected cases local anæsthesia combined with gas analgesia is useful, and very extensive operations were often performed with it.

ISABELLA I. HERB, M.D.

Kulenkampff, D.: The Treatment of States of Excitement During Ethyl Chloride Anæsthesia (Die Bekämpfung schwerer Erregungszustände während der Narkose durch Chloräthyl). *Zentralbl. f. Chir.*, 1921, xlviii, 186.

An important point which has not been emphasized in the literature of anæsthesia is that we can change anæsthetics at will during the course of an anæsthesia. Each of the various anæsthetics in use does not have a specific effect peculiar to itself, but all of them have a paralytic effect on the oxygen carrier. The least irritating of anæsthetics when given by inhalation is ethyl chloride.

Occasionally in the cases of patients who have been poorly prepared for anæsthesia and those who are psychopathic and hysterical there is an intense state of excitement at the beginning of anæsthesia which can be overcome only by giving very large amounts of the ether or chloroform vapor. In such cases ethyl chloride given as for ethyl chloride anæsthesia has often an almost magical effect in from half a minute to a minute. A strong dose must be administered with a tube that drops very rapidly so that 100, 150; or 200 drops are given so quickly that they can scarcely be counted, and the hand should be laid on the gauze to increase the concentration of the vapor. Almost immediately the patient becomes quiet and falls into a deep, snoring sleep. Care must be taken to stop immediately when this state is reached.

While the method is not without some danger, it is less dangerous than the use of ether or chloroform to overcome the excitement. The probable explanation of the action of ethyl chloride is that it is non-

irritating to the respiratory centers. Many disturbances during anæsthesia would never occur if the anæsthetics were non-irritating gases. Partly by arousing feelings of anxiety and suffocation, partly by causing a reflex change in the type of breathing, they prevent uniform oxidation of the blood and produce carbonic acid spasms. That the narcotics as such are not responsible for this effect was long ago proved by Berth's experiments on tracheotomized rabbits and more recently by intravenous anæsthesia. The technique employed at Zwickau at present is as follows:

Braun's apparatus is used. Every anæsthesia is begun with ethyl chloride which is by far the most pleasant anæsthetic for the patient. Later it is continued with ether-chloroform. At the beginning of the narcosis the ether cock is often closed for a moment as the ether irritates the respiratory organs and by causing a feeling of suffocation disturbs the patient's psychic condition. The slightest feeling of suffocation produces also a state of excitement in the brain cortex which is not favorable to narcosis. If in the further course of the anæsthesia such signs appear a strong dose of ethyl chloride is given. This is the best method of deepening narcosis quickly and preventing vomiting.

KULENKAMPFF (Z).

Fidel Pagés: Regional Anæsthesia (Anestesia metamérica). *Rev. españ. de cirug.*, 1921, iii, 121.

Fidel Pagés blocks the nerve roots with novocaine in the epidural space. The injection is made at the spinuous process corresponding to the region to be operated upon. For instance, for operations on the stomach, which is innervated by the sixth to the twelfth dorsal roots, the spinuous process of the eighth dorsal is selected. When an injection is made at this level the sixth to twelfth roots are blocked. The needle is inserted at a point 1 or 1½ cm. outside the process and directed forward in search of the yellow ligament. The yellow ligament is met at about 12 cm. from the skin. In the penetration of the dorsal column the imbrication of the laminæ makes a more ascending direction necessary. After the needle has passed the yellow ligament the anæsthetic is injected. When an operation is to be done on only one side of the body the puncture is usually made on that side.

The needle must be inserted into the epidural cavity in such a way that there is no danger of penetrating the dura. The anæsthetic solution used is 2 per cent novocaine with adrenalin. The injection of 20 c.cm. between the first and second lumbar vertebræ anæsthetizes a zone on both sides from the ninth dorsal to the fourth lumbar inclusive, while an injection of 25 c.cm. between the eighth and ninth dorsal vertebræ causes anæsthesia suitable for operations on the stomach and the lower part of the chest. Anæsthesia is complete after fifteen minutes. There is no need for pre-operative preparation of the patient. The anæsthesia lasts for at least an hour and a half.

Intraspinal blocking has the disadvantage that the anaesthesia is tardy as compared with that induced by other methods, and as a rule it cannot be used to anaesthetize the zones innervated by the cranial nerves. Generally, however, intraspinal epidural anaesthesia is preferable to paravertebral or spinal anaesthesia because it does not require the use of large quantities of anaesthetic and there is less danger of intravascular injection. Regional anaesthesia has advantages over the arachnoidal and paravertebral methods whenever it is necessary to operate in zones innervated by the spinal nerves. With the paravertebral method only half the body is anaesthetized. In the spinal method there are disadvantages arising from the dissolution of the anaesthetic in the cerebrospinal fluid which often provokes distant lesions.

The only contra-indication to regional anaesthesia is youth; the method should be used only on adults.

A list of 43 cases operated upon under regional anaesthesia is given. These include cases of hernia, appendicitis, gastric resection, and operations on the lower limbs and uterus. Anaesthesia was complete in 40. In 2 cases the failure was due to faulty technique. There were no untoward postoperative effects.

W. A. BRENNAN.

Labat, G. L.: Regional Anaesthesia in Surgery of the Head. *Minnesota Med.*, 1921, iv, 195.

The technique of circumferential infiltration, or "field blocking" anaesthesia, has a tendency to replace local infiltration along the line of incision. Its adoption is based on: (1) the absence of distortion of the anatomical features of the operative field, (2) anaemia of the tissues within the blocked area due to the epinephrin in the novocaine solution, (3) muscular relaxation which facilitates the use of retractors, and (4) the absence of defective healing of the wound such as is sometimes seen following direct infiltration.

Regional anaesthesia is of great advantage in operations on the head which receives its sensory nerve supply from the trigeminus and the upper cervical nerves. These nerves become subcutaneous on a line encircling the head above the ear and are therefore easily anaesthetized by subcutaneous injection, the scalp and cranium being thus anaesthetized.

The first branch of the trigeminus is not accessible, but the various ophthalmic nerve branches may be blocked in the orbit or outside. The superior maxillary branch may be blocked at the foramen rotundum, and the third branch, or inferior maxillary, at the foramen ovale. The inferior dental and lingual nerves are reached on the medial aspect of the ascending ramus, near the dental foramen.

In dental and ophthalmic surgery, nerve blocking is the method of choice. When extensive lateral sutures are proposed a line of infiltration is made just above the zygomatic arch and extended anteriorly and posteriorly to meet at the glabella

and occiput, passing above the superior margin of the orbit and above the ear. Along and above the zygoma deep injections should be made down to the bone in order to reach the temporal nerves.

Carrying injections within the superficial fascia and under the epicranium renders craniectomies painless. The removal of malignant growths involving the dura, the treatment of depressed fractures, the evacuation of epidural or subdural haemorrhage or of intracranial abscesses, the raising of osteoplastic flaps, the removal of cerebellar tumors may all be successfully executed by this method.

Partial or complete resection of the tongue can be done with infiltration and nerve blocking anaesthesia. If a partial resection is desired, infiltration is done posteriorly and laterally to the lesion in order to wall off the growth and anaesthetize the quadrant in which it lies. Total resections are made by: (1) blocking the dental and lingual nerves on the side of the ascending ramus, (2) injecting the cervical plexus, (3) infiltrating the base of the tongue so as to block the glossopharyngeal, and (4) blocking the superior laryngeal.

In ophthalmic surgery, regional anaesthesia has been elaborated by Duverger. The intra-orbital and retro-orbital nerve trunks may be approached through the orbit, the smooth bony surface and fissures serving as landmarks and guides. Care should be exercised always to keep the point of the needle in close contact with the bone, thus keeping it away from the axis of the orbit which is the dangerous zone.

In extensive operations such as enucleation, however, the apex of the muscular cone of the eyeball is infiltrated intentionally. As a rule the puncturing is done at two points. The first injection, which is made a little above the exterior angle of the palpebral fissure, is given to block the frontal and lachrymal nerves; the second, which is made a little above the internal palpebral fissure, points toward the nasal nerve.

By subcutaneous and deep injections the external ear and auditory canal may be anaesthetized. The same procedure may be used to anaesthetize the entire mastoid region.

The author suggests the use of rectal oil ether anaesthesia combined with regional blocking for any extensive intervention on the base of the skull such as resection of the posterior root of the fifth nerve for trifacial neuralgia.

Fresh novocaine-epinephrin solutions are the best and are made by dissolving sterile novocaine powder in sterile normal saline (0.9 gm. of sodium chloride for each 100 c.cm. of double distilled water) and adding to every ounce of the novocaine solution five drops of epinephrin solution (1:1,000) immediately before use, irrespective of the strength of the novocaine solution.

For operations on the skull a 1 per cent solution should be used. Weaker solutions give anaesthesia of shorter duration and produce extensive and painful oedema. For blocking the branches of the

trigeminus, an injection of 2 to 3 c.cm. of a 2 per cent solution is given.

Shaving a narrow band around the scalp wound and inducing anæsthesia along this band before scrubbing and disinfecting the wound is a procedure worth following as it renders all subsequent manipulations painless.

As a rule one hypodermic injection of scopolamine, 0.0002 gm. (1/300 gr.), and morphine, 0.01 gm. (1/6 gr.), is given one hour before anæsthesia is begun. This may be repeated if the patient is still nervous.

A. C. JOHNSON, M.D.

Labat, G. L.: Regional Anæsthesia, with Special Reference to Splanchnic Analgesia: A New Method Applicable to Abdominal Surgery. *Brit. J. Surg.*, 1921, viii, 278.

Laewen, in 1911, reported a series of abdominal operations successfully performed under paravertebral conduction anæsthesia. In 1917, Wendling reported 27 cases in which anæsthesia for various gastric operations was obtained by injections of 50 to 80 c.cm. of 1 per cent novocaine solution through the anterior abdominal wall into the solar plexus or its vicinity. Allen and Pauchet obtained the same result by injecting a small quantity of novocaine-adrenalin directly into the solar plexus after opening the abdomen.

In 1919, Naegeli reported 18 cases in which anæsthesia was successfully induced by injecting the splanchnic nerves through the posterior abdominal wall. The author also was led to select a posterior route at this time because he believed the pain of gastric operations was due chiefly to traction on the parietal peritoneum causing cleavage of the retroperitoneal tissue which is richly supplied by cerebrospinal nerves.

Patients in a state of lowered resistance, auto-intoxication, and abnormal metabolism may be operated on more safely under regional than under general anæsthesia as the former does not affect the central nervous system. In order to allay emotional excitation and mental apprehension it is well to blunt consciousness with a solution of 1/4 mgm. of scopolamine and 1 cgm. of morphine one hour before the anæsthesia is begun.

The author lays stress on the facts that novocaine-adrenalin solutions are the safest, that novocaine-cocaine mixtures are dangerous, and that pure cocaine solutions should never be used in regional anæsthesia.

Labat's method consists of local infiltration of the anterior abdominal wall followed by splanchnic injections. Five anæsthetic wheals are raised as follows: (1) at the tip of the xiphosternum; (2, 3) one on each side at the level of the tenth costal cartilage where the exterior border of the rectus crosses the costal margin; (4, 5) one on each side on the external border of the rectus, a little higher than the umbilicus.

The needle, which is 8 or 10 cm. in length, is passed through each wheal and the infiltration

made fanwise. The deep layers should be infiltrated first and the more superficial layers later. The solution is injected within the rectus sheath. This is quite sufficient to anæsthetize the underlying peritoneum and gives good relaxation of the abdominal wall.

For splanchnic analgesia the patient lies on his side with the back arched. A cushion is placed under the loin to relax the muscles and render the landmarks more accessible. The twelfth rib and the spinous process of the first lumbar vertebra are defined and an anæsthetic wheal is raised 7 cm. from the midline on the lower border of the twelfth rib. A needle 12 cm. in length is passed through the wheal along the horizontal plane of the body, i.e., vertical to the table on which the patient is resting. The needle is introduced obliquely forward so that it makes an angle of about 45 degrees with the median plane. Its point then strikes the body of the vertebra near its anterior convexity behind the splanchnic nerves, just where the latter join the semilunar ganglion. When the needle has struck the bone at about 9 cm. from its point of entrance, it is drawn back until its point reaches the subcutaneous tissue so that its direction may be changed. It is then re-introduced at a smaller angle and as soon as the point is felt gliding along the surface of the vertebra it is pushed in 1 cm. further. At this point from 25 to 35 c.cm. of a 1 per cent novocaine-adrenalin solution are injected after it has been ascertained that no blood comes out of the needle. This procedure is then repeated on the other side.

The solution spreads into the loose retroperitoneal tissue and, diffusing in all directions, reaches the solar plexus and its tributaries.

The method was used in 34 cases for abdominal operations, 24 of which were resections of the stomach by Pauchet. A good anæsthesia was obtained in 21 cases.

A. C. JOHNSON, M.D.

Billet, H., and Laborde, E.: Regional Anæsthesia: A Note on the So-Called Splanchnic Anæsthesia (Anesthésie régionale; note au sujet de l'anesthésie dite des splanchniques). *Presse méd.*, Par., 1921, xxix, 261.

Splanchnic anæsthesia permits long and delicate operations in the upper part of the abdomen with little risk to the patient and without trouble to the surgeon.

It might be thought that the *modus operandi* of injection would be dangerous but according to the authors this is not true. The patient lies first on the right side and then on the left. The needle, which is 12 cm. long, is inserted at the lower edge of the twelfth rib, 7 cm. from the line of the spinous processes. At first it is inclined at an angle of 45 degrees until it strikes the vertebral body. Its inclination is then increased until it is tangential to the vertebra, when the operator will perceive by the sensation that it has left the muscle mass and has entered the paravertebral cellular tissue. At this point 25 c.cm. of a 1:100 novocaine solution are

injected. The manoeuvre is then repeated on the other side. When the needle reaches its maximum insertion it is embedded from 9 to 11 cm. The point where it penetrates the cellulo-fatty paravertebral tissue corresponds almost exactly to the union of the anterior and lateral surfaces of the vertebral body. This tissue contains the splanchnic nerves, the sympathetic ganglia, the solar plexus, the aorta, the vena cava, and their branches.

With regard to the danger arising from a badly directed insertion of the needle the authors state that their studies and experience show that there is little risk of injuring the aorta or the vena cava. To reach the vena cava it would be necessary to give the needle a direction perpendicular to the ligaments. There is danger, however, of puncturing the left renal vein but this can be avoided.

The anæsthetic solution acts by infiltrating the cellular tissue and by inhibiting the nerve elements contained in this tissue. It is necessary, therefore, to give the injection time to diffuse before the operation is begun. The authors have found that a unilateral injection of 50 c. cm. may be given instead of bilateral injections of 25 c. cm. each.

In all operations for gastric, duodenal, or renal affections performed by Pauchet at the St. Michel Hospital this form of anæsthesia is used.

W. A. BRENNAN.

Bloch, R.: Supra-Umbilical Anæsthesia by the Low Injection of Novocaine into the Spine (Anesthésie sus-ombilical par injection basse de syncaïne dans la rachis). *Presse méd.*, Par., 1921, xxix, 316.

The author states that while the duration of anæsthesia depends upon the dose of the anæsthetic, the quantity of cerebrospinal fluid extracted determines the height of the anæsthesia. As much as 30 c.cm. of fluid may be extracted; this permits anæsthesia as high as the breasts. Prior injections of morphine and caffeine or sparteine should be given.

With the patient in the sitting posture, a Delmas needle is inserted between the second and fifth lumbar vertebræ and about 30 c.cm. of cerebrospinal fluid are allowed to flow out. If anæsthesia lasting about one and one-half hours is desired the injection consists of 12 ctgm. of novocaine to which usually about $\frac{1}{4}$ mgm. of adrenalin is added. Before the injection is made the position of the needle should be verified by withdrawing a little of the spinal fluid into the syringe. Such a precaution will prevent the principal and most frequent cause of failure.

In the author's last 54 cases in which anæsthesia was induced by this method for supra-umbilical operations the results were successful in 49 and fair in 3.

W. A. BRENNAN.

Mayer, A.: Experiences with Lumbar Anæsthesia (Erfahrungen mit der Lumbalanaesthesie). *Deutsche med. Wchnschr.*, 1920, xlv, 1325, 1356.

This article is based on 3,310 gynecological operations. The anæsthetic was at first stovaine and later

novocaine. In 92 per cent of the cases there was complete anæsthesia. In 6 per cent of those in which lumbar anæsthesia was combined with inhalation anæsthesia there were 2 per cent of failures. In vaginal operations complete anæsthesia was obtained in 95 per cent. The duration of the anæsthesia, generally one or two hours, was usually sufficient for the operation. The worse the general condition, as in anæmia or undernutrition, the greater the percentage of failures. As a psychic preparation, an individualized twilight sleep was given.

There was vomiting in 1.6 per cent of the cases. In 13 per cent there was postoperative headache. Among the anæmic patients its incidence rose to 80 per cent. As the usual explanations of the cause of this condition did not satisfy the author, he made puncture tests to verify the correctness of Hosemann's theory that it is due to a rise or fall of pressure. Neither these tests nor the corresponding treatment confirmed the theory. The duration of the headache in 40 per cent of the cases was three days; in 36 per cent, eight days; in 6 per cent, fourteen days. Such headaches, which sometimes amount to torture, are a drawback to lumbar anæsthesia. Inhalation anæsthesia, however, is sometimes followed by pain.

Paralysis of the abducens was rare and recovery usually resulted in from four to six weeks even in serious cases. More frequently there were trophic disturbances in the legs, body, and hands, and deep, wedge-shaped necroses of the sacrum resembling bed sores. These are analogous to herpes zoster. Spielmeyer observed cortical degeneration of the posterior roots, a condition resulting from intoxication. In the second year of the war all by-effects were more frequent. This was perhaps due to increased irritability and undernutrition. According to Mansfeld, if there is insufficient body fat more of the narcotic is stored in the brain cells. Possibly a deficiency in calcium is also a factor. The author does not agree with the lipoid theory. He regards as more correct the permeability theory according to which the effectiveness of narcotics is due to their capacity to penetrate the cell membrane, a capacity which is increased by a deficiency in calcium. These facts perhaps explain the severe and undesirable by-effects of lumbar anæsthesia.

In 8 cases the anæsthesia was associated with collapse and disturbances of breathing, but recovery resulted. The author believes that these complications were due partly to the pushing up of the diaphragm by large tumors. Rapid removal is the only treatment giving relief. In 5 cases death occurred during or after the operation from respiratory paralysis or collapse. It is questionable whether the anæsthetic was in any way responsible for two of these fatalities as the collapse was probably caused by the removal of a huge tumor. One patient died of meningitis. This is the eleventh case of the kind reported in the literature. There were 6 deaths in 3,310 cases, 0.18 per cent or 1 in 551. This high mortality, which is about midway between

the extremes reported in the literature, is probably due partly to the fact that all of the patients with one exception were in very poor condition. Three women died eight to fourteen days after the operation from sinus thrombosis. According to the pathologist, the lumbar anæsthesia was in no way responsible.

One advantage of lumbar anæsthesia is the complete lack of tension of the abdominal wall. Because of the extremely simple technique and the excellent anæsthesia obtained, the author states that he would not give up this form of anæsthesia in spite of certain, not altogether avoidable dangers.

KULENKAMPF (Z).

Kaiser, F. J.: Methods of Combating the Unfavorable Effects of Lumbar Anæsthesia (Die schädlichen Nebenwirkungen bei der Lumbalanæsthesie und ihre Bekaempfung). *Deutsche med. Wchschr.*, 1921, xlvii, 178.

The author reviews the literature on the disturbances due to lumbar anæsthesia and the methods of overcoming them. The anæsthetic used for this type of anæsthesia is novocaine-suprarenin solution. Puncture is made between the second and third lumbar vertebræ. The skin is disinfected with ether and iodine and the iodine removed with ether. The author does not believe that the trickling of spinal fluid following the use of the ordinary direct puncture needle has anything to do with the disturbances, but he uses a small needle 10 to 12 cm. long such as that ordinarily employed for local anæsthesia. If there is bleeding during the puncture he does not make the injection. If bleeding does not occur, 3 c.cm. of spinal fluid are removed and a corresponding amount of the solution is injected slowly. As a rule the patient is placed in the lateral position but sometimes in old cases of kyphosis he is seated. Trendelenburg's position is used only in cases of moderate kyphosis (20 to 40 degrees) with extreme flexion of the head.

The author finds that in the literature no distinction is made between the symptoms accompanying the anæsthesia, those immediately following it, and those developing later. The symptoms he calls

"accompanying symptoms" occur within the first three hours and consist of pallor, sweating, nausea, vomiting, dizziness, loss of consciousness, difficulty in breathing, and irregularities of the heart. They indicate involvement of the medulla oblongata. The after-symptoms are headache and what has been called "meningism." The latter is undoubtedly a temporary serous meningitis due to increase of fluid under pressure. The late symptoms are chiefly paralysis of the muscles of the eye appearing not less than a week later and indefinite symptoms such as a feeling of pressure in the head, paræsthesia, neuralgic pain, and partial loss of memory.

Kaiser regards severe shock or collapse after injuries as a contra-indication to the use of lumbar anæsthesia. In such cases ether anæsthesia is better. Preliminary morphine and scopolamine should not be given. In none of the author's cases was there a fatal outcome or any very serious effect. He does not state the number of his cases. Thirty per cent of the patients had after-effects; 10 per cent, accompanying symptoms; and 20 per cent, late symptoms. The anæsthesia failed in 4 cases. As his experience increased the number of after-effects sank to 10 per cent.

Careful attention should be given to the following points: the use of a good solution, perfect asepsis, the complete removal of iodine following disinfection, and the avoidance of the use of chemical fluids on the instruments. No morphine or scopolamine should be used before the anæsthesia. The patient should be in the lateral position. The needle should be very fine and should be pushed in until it just reaches the sheath of the lumbar cord. If there is hæmorrhage this type of anæsthesia is contra-indicated. No spinal fluid should be aspirated and only 3 c.cm. should be allowed to flow out. The injection should be given slowly. The pelvis should not be much raised when the operation is to be above the first lumbar vertebra. The head should be very much flexed. Contra-indications should be strictly observed. If severe after-effects develop, repeated lumbar punctures should be made, abundant fluid given, and the patient kept on his back.

KULENKAMPF (Z).

SURGERY OF THE HEAD AND NECK

HEAD

Bury, J. S.: Gunshot Injury to the Brain Involving Both Cortical and Subcortical Tissue. *Brit. M. J.*, 1921, i, 556.

The author reports a case of gunshot injury to the brain which shows the difficulties involved in determining the relative extent of sensory disturbance due to cortical and to subcortical destruction. Private X, aged 32, was shot in the head with a rifle bullet March 10, 1915. When he fell he thought "he saw little devils and bells were ringing." He does not believe he lost consciousness because he

heard someone shout "stretcher-bearers." When consciousness was fully restored he found his right leg crossed over the left leg. Although he could move both slightly, they were useless, as was also the left arm. A trephination was done that night and his legs regained power slowly. In about twenty-one months he was able to hobble about feebly with the help of a cane. An X-ray of the head showed nothing abnormal except the trephined area.

Six years after the injury his mental state, speech, special senses, pupils, and the movements of his eyes were normal. The wound lies 2 to 3 cm. to the right of the middle line, its anterior end being 16 cm. from

the nasion and its posterior end 19 cm. from theinion. Near the anterior end of this depression the pulsating of the brain can be felt. The probable position of the lesion is shown by a diagram.

The right hand and arm are normal, but the left arm is rigid. Some movements of the right foot are weak and there is left hemiplegia. The reflexes are hyperactive, especially on the left side, where double ankle clonus and Babinski phenomena are noted. Sensation on the right side is normal; on the left it is diminished to the cotton wisp, particularly in the hand and foot, and to a lesser degree in the arm and leg. The patient appreciates the sensation of roughness. The sense of vibration is present on the left side, although slightly diminished, as is that of pinprick. The pressure sense, as measured by the algometer, is greater on the left side, the amount being 10 on the left palm and 7 on the right. Thermal sensibility is not impaired.

The sense of position in the hand is definitely disturbed since slight passive movements of the fingers are not recognized; moreover, the position of the arm in space is not recognized with the eyes closed. Stereognosis is lost, and any common object placed in the left hand is not recognized.

The main features of this case, namely, the hemiplegia and the hemi-anesthesia, indicate a subcortical rather than a cortical lesion. The paralysis of certain movements of the right foot shows that the lesion is not limited to the right cerebral hemisphere, but crosses the middle line to implicate the top of the left precentral convolution or, more probably, the fibers proceeding from it.

The changes in sensation on the left side cannot be explained wholly, however, by a subcortical lesion. Interference with the sensory activity of the cortex is indicated by the inability to recognize objects in the hand. The loss of the power to recognize the posture of the affected arm, a striking feature of the case, may occur in subcortical as well as in cortical lesions.

A. C. JOHNSON, M.D.

Pfeifer, B.: The Peripheral Surgical Treatment of Spastic Paralysis in Injuries and Organic Diseases of the Brain (Die periphere chirurgische Behandlung spastischer Laehmungen bei Hirnverletzten und anderen organischen Erkrankungen des Gehirns). *Deutsche Ztschr. f. Nervenheilk.* 1921, lxxviii, 9.

The indications for peripheral operation are spastic hemiplegias and monoplegias. Twenty-seven patients were operated upon; 22 of them, with cerebral hemiplegias, monoplegias, and milder forms of paraplegias of the legs by the peripheral method and 5 who had severe cerebral paraplegias of the legs, by the central method, resection of the posterior roots of the cord.

Of the 22 cases operated on by the peripheral method, 17 were cases of cerebral hemiplegias, 13 of which were due to gunshot injuries of the brain and 4 to brain disease caused by injuries to the internal carotid, infectious diseases, dysentery, or

pneumonia. The operations were done by Foerster's method. The nerves were laid bare for several centimeters and after the extent of their function had been determined by the use of the faradic current they were resected.

In the arm the median nerve was most frequently affected (19 times). In some cases later operations, such as lengthening of the tendons, were necessary. The number of cures was less in the upper than in the lower extremity. In some cases, especially those in which the hand and finger joints were involved, the spasms which stopped after the operation reappeared later. There is no doubt that their reappearance was due to regeneration of the resected motor bundles. Pfeifer comes to the following conclusion:

Though the results of Foerster's peripheral operation were not entirely satisfactory in the upper limb in all cases, they were so much better than those obtained by the earlier methods of massage, electricity, and exercise, that undoubtedly y Foerster's operation should be performed in properly selected cases of spastic paralysis.

VALENTIN (Z).

Nederle, B.: The Operative Treatment of Brain Tumors, with Remarks upon Drainage (Zur operativen Therapie der Hirngeschwulste mit Bemerkungen zur Drainage). *Casop. lek. cesk.* 1921, lx, 51.

A 19-year-old girl had suffered for four years, from increasing headache and epileptic attacks. In the further course of the disease there was atrophy and paresis of the right upper and lower extremity, paresis of the left facial nerve, and bilateral choked disc. The condition was diagnosed as a benign tumor in the lower part of the left central convolution.

Operation was performed in two stages. A fibroma the size of a hen's egg was removed. The wound was then closed around a small drain. The drain was removed after three days. In spite of the fact that the opening was closed with a suture, prolapse of the brain into the drainage canal occurred and was overcome only with great difficulty.

In a second case of tumor of the right motor region there was severe collapse after the extirpation of the tumor and it was necessary to finish the operation quickly. A part of the wound cavity was tamponed on account of venous hemorrhage. After the removal of the gauze prolapse of the brain broke down the sutures and within five weeks led to necrosis, infection, and death.

The pressure within the skull seems to increase rapidly after the removal of a tumor, the vessels of the brain dilate quickly, the tissues become oedematous, and this acute oedema further increases the pressure. If any opening is left in the skull prolapse of the brain may occur.

Krause believes the chief cause of prolapse is injury of the meninges, but in the two cases reported the meninges were certainly not injured, while in many cases of operation for Jacksonian epilepsy

and extirpation of scars or meningeal cysts there is not the slightest indication of prolapse. At any rate, primary complete closure of the wound in operations for brain tumor is of great importance.

KINDL (Z).

Lockwood, B. C.: A Cholesteatomatous Cystic Tumor of the Pituitary Gland: Report of a Case, with Discussion of the Diagnosis of Pituitary Disease. *J. Am. M. Ass.*, 1921, lxxvi, 1218.

Lockwood reports a case of cholesteatomatous cystic tumor of the pituitary gland and calls attention to some local and hormonal signs of pituitary disease which are often overlooked. Headache caused by the distention of the glandular envelope is a common early symptom. It is often very severe and is described as bitemporal.

Because of the relationship between the optic chiasm and the pituitary gland ocular manifestations are probably the most common local symptoms. Pressure of a tumor of the pituitary gland first involves the fibers going to the nasal half of the retina and produces first loss of color vision and then loss of form vision, causing blindness in the temporal fields.

As a rule changes in the size and shape of the sella turcica are demonstrated by the roentgen ray in cases of pituitary tumor, but as there is much variation in the normal sella in different persons, very early changes are hard to distinguish.

The hormonal signs are due to deficient or excessive secretion of the anterior or posterior lobe or both lobes.

From clinical observation and experimental work it seems that the secretion of the pituitary gland controls the growth and the function of the body as follows:

Anterior lobe: (1) osseous growth and development; (2) genital growth and function; (3) muscular strength and development; (4) dermal changes, such as the texture of the skin and hair; (5) blood pressure and, to a less degree, the temperature and pulse; (6) to some extent, mental development. Posterior lobe: (1) metabolism, as judged by carbohydrate tolerance, basal metabolism, and the deposit and distribution of fat; (2) involuntary muscle tonus; (3) other endocrine glands; (4) mental activity; and (5) temperature and pulse.

The case reported by the author, which came to autopsy and showed a rare form of the cystic tumor, demonstrated the futility of the use of the roentgen ray as a therapeutic measure for this type of growth. Roentgen treatment is of value only when the tumor is an adenoma. Operative procedure is indicated in all cases.

H. A. McKNIGHT, M.D.

Sistrunk, W. E.: Mixed Tumors of the Parotid Gland. *Minnesota Med.*, 1921, iv, 155.

During the early stages mixed tumors of the parotid are small, encapsulated, and only mildly malignant. If they are operated on during this period,

the danger to the facial nerve is slight and a permanent cure is obtained in most cases.

Mixed tumors occur twelve times as often in the parotid as in the submaxillary glands and practically never occur in the sublingual salivary glands.

When the capsule is ruptured by trauma or the growth of the tumor, the neoplasm usually invades the surrounding tissues and may undergo highly malignant changes.

These tumors show varied pathologic pictures. They are generally composed of epithelial elements, cartilage, and fibrous tissue. Some pathologists believe them to be mesotheliomata while others regard them as basal-cell epitheliomata and carcinomata. Sections from the same tumor often show totally different histologic structures.

Surgery seems the best treatment as radium and the X-ray have but little effect on the growth. An oblique incision is made $\frac{3}{4}$ or 1 in. below the angle of the jaw in one of the creases of the neck. The tumor often lies superficially on the anterior surface of the gland and can be enucleated readily. If this is done without rupturing the capsule, a permanent cure almost always results. If the capsule ruptures it is best to separate it from the surrounding tissue by blunt dissection and remove it entirely. The cavity should be washed out and then swabbed with Harrington's solution in order to devitalize any malignant cells remaining in the wound.

Facial paralysis rarely occurs following operations for small tumors of the parotid, although there is an occasional transient paralysis resulting from the trauma of operation. This usually subsides, however, in from six weeks to one year after the enucleation. In operations on extensive growths the facial nerve is exposed by isolating its inframandibular branch which runs along the angle of the jaw. This is dissected upward through the substance of the gland to the two main divisions of the nerve. The lower pole of the parotid may then be lifted up and the dissection completed above the nerve.

Sistrunk has been able to follow up 93 of 103 patients operated on at the Mayo Clinic from 1915 to 1919. Eighty-five of these are known to be alive and 8 are dead. Six of the latter are known to have died of recurrence and all 6 had extensive growths at the time of operation. In 4 of them the glands were involved. Four of the 6 were operated on also one or more times elsewhere.

A primary operation was performed on 66 patients. Fifty-six of the 60 for whom data are obtainable are alive and 4 are dead. Forty-nine have had no recurrence from one to five years following the operation; 11 are known to have a recurrence. Thirty-seven patients were operated on for recurrences which had developed following one or more previous operations; 34 of these had been operated on elsewhere and 3 are dead. The tumor is known to have recurred in 14 instances. All the recurrences appeared within one year after the operation.

Of the patients with primary operations 93.4 per cent are alive, 18.3 per cent have had recurrences (including those who died), and 6.6 per cent are dead. Of those operated on for recurring growths 89.2 per cent are alive, 37.8 per cent have had recurrences (including those who died), and 10.8 per cent are dead.

Four of the 66 patients on whom primary operations were performed presented themselves with complete facial paralysis due to the pressure of the tumor. It was necessary to sacrifice the nerve in 6 instances on account of the extensive involvement. In 16 cases in which efforts were made to preserve the nerve there was temporary complete paralysis. One patient had a permanent partial paralysis and another a permanent complete paralysis. In 3 of 13 cases in which the tumor was enucleated a temporary complete paralysis developed, and in 2, a complete paralysis. In 3 patients temporary partial paralysis occurred, and in 5 a permanent partial paralysis. Two patients had a salivary fistula; in one case this followed a primary operation, and in the other, an operation for recurring tumor.

A. J. SCHOLL, JR., M.D.

Pólya, E.: Making a New Lower Lip from the Upper Lip (Ersatz der Unterlippe aus der oberen). *Zentralbl. f. Chir.*, 1921, xlviii, 262.

The method described can be used in total or subtotal loss of the lower lip when the defect is long and not more than 2 cm. wide. Half of the mucous membrane of the upper lip, either alone or with a strip of skin not more than 1 to 1½ cm. broad, is sutured into the corresponding half of the defect in the lower lip which has been shaped into a long quadrangle. After two weeks the other side of the lower lip is covered with a similar flap from the other side of the upper lip.

The normal upper lip is restored by making two flaps by a V-shaped incision beginning at the alæ nasi and meeting in the middle of the upper lip. The two flaps thus made are then sutured in the midline.

TROMP (Z).

NECK

Peabody, F. W., Sturgis, C. C., Tompkins, E. M., and Wearn, J. T.: Epinephrin Hypersensitiveness and Its Relation to Hyperthyroidism. *Am. J. M. Sc.*, 1921, clxi, 508.

The authors discuss the two procedures which are in extensive use in this country at the present time for the determination of functional hyperactivity of the thyroid gland. One of these, the measurement of basal metabolism, rests on sound experimental and clinical observations, for there is abundant evidence that stimulation of the thyroid gland or the administration of its active principle causes an increase in heat production. The outstanding drawback to this method is that even with the recently simplified technique it requires specialized training and experience both for its application and for the

proper interpretation of the information derived from it.

The second procedure consists of the injection of epinephrin. Its diagnostic significance depends on the type of reaction which occurs in patients with hyperthyroidism and is supposed to be characteristic of this condition. The test is usually carried out by the method suggested by Goetsch, 0.5 c.cm. of a 1 : 1,000 solution of epinephrin being administered. This procedure is so easy to apply and apparently so simple to interpret that it has been widely adopted as a diagnostic measure, and the "positive" reaction is frequently considered as an indication even for surgical interference. Regarding this test as highly specific in its significance, it seemed to the authors of importance to study in greater detail the nature of the reaction and the conditions under which the "positive" reaction, which is assumed to indicate epinephrin hypersensitiveness, appears.

The difference between positive and negative reactions to epinephrin is quantitative, and what clinical significance the test possesses depends on the selection of a proper differentiating dose. A fundamental part of the investigation obviously consisted of the control observations carried out on normal individuals. These were begun in the army. It was soon found that the problem was complicated by the fact that the standards of normality were not clearly defined. A group of 26 men from an organization which had undergone training for fourteen months and was on its way overseas was therefore studied. None of these was found to give positive reactions to epinephrin. A second group of normal men tested consisted of 28 Harvard medical students. Among these, 4 (14 per cent) gave very definite positive reactions. The general conclusions which seemed justifiable from these observations were as follows:

Different persons, both those who were ill and those who were well, reacted with different degrees of intensity to the injection of epinephrin. By means of selected dosage and carefully chosen criteria for the response, it was possible to differentiate somewhat artificially between the slight reactions which were called negative and the more violent reactions which were called positive. In certain instances doubtful or questionable reactions were obtained.

The fundamental nature of the reaction is unknown. It was associated with an increase in heat production which ran more or less parallel to the intensity of the reaction. On the basis of what is definitely known regarding the physiological action of epinephrin it seems probable that the phenomenon was due to a stimulation of the sympathetic nervous system. Theoretically a positive reaction might have indicated hyperactivity of the thyroid gland, the adrenal glands, or the sympathetic nervous system. On the other hand, it might depend on a lowered threshold of response of the sympathetic nervous system. With the exception of hyperthy-

roidism, little is known about these conditions in man, but they probably occur and there seems to be no reason to assume that a positive epinephrin reaction is constantly associated with hyperthyroidism. It is much more probable that different causes account for the reaction in different types of clinical cases.

Hypersensitiveness to epinephrin was found in many patients with the clinical picture of hyperthyroidism and an increased basal metabolism, but it was not constant under these conditions.

It was found also in persons who had no indications of hyperthyroidism. Thus it was noted in many psychoneurotics, in about 50 per cent of patients convalescent from acute infections, in nearly the same proportion of soldiers with "effort syndrome," in 14 per cent of apparently normal young men, and in patients with various unrelated diseases.

The positive reaction to epinephrin appeared to occur most often in very nervous persons, but it was not constant in such cases. The clinical significance of the reaction was not clear, but in the authors' opinion it is of no specific significance in the diagnosis of hyperthyroidism.

G. E. BEILBY, M.D.

Wolff, G.: Proliferating Goiter; A Contribution to Malignant Epithelial Tumors of the Thyroid (Wuchernde Struma; ein Beitrag zur Lehre von den epithelialen boesartigen Geschwuelsten der Schilddruese). *Beitr. z. klin. Chir.*, 1920, cxxi, 56.

This is a description of three cases from the Goettingen surgical clinic. One case is described in detail and illustrated with four plates.

The patient was a youth 17½ years of age. In 1913 half of the thyroid was excised for goiter and in 1917 a cyst on the left side was enucleated. The pathologic diagnosis after the second operation was carcinoma of the thyroid. In February, 1919, the patient was admitted to the hospital again with a large nodular tumor involving both sides of the neck. The operation was very difficult but was followed by uneventful recovery.

The tumor was 8 by 6 by 5 cm. in size and consisted of several round nodules. It had a lobular structure as there were septa extending into it from the connective tissue capsule. In color it was grayish-yellow to yellowish-white with hæmorrhagic spots. Microscopic examination showed a connective tissue capsule at the periphery of the nodes; immediately under this were clumps and bands of cells separated by fissures. Toward the center the connective tissue decreased; the fine bands of darkly staining cells were interspersed with vesicles which gave the growth a lattice-like appearance. At one point on the periphery the tumor cells had broken through into the musculature. A characteristic feature was the presence between the epithelial cell masses of fissures with a single capillary wall which contained blood (Minot's sinusoids.) This part of the picture coincided completely with the

form of tumor described by Langhans as proliferating goiter. One nodule had a papillomatous structure. The tissue was very similar to foetal thyroid tissue.

The author agrees with Langhans and Zehbe that proliferating goiter begins during embryonic life. The case reported showed the characteristics of malignancy in that the growth had broken through into the muscles. There were no metastases.

The second case was that of a brother of the first patient. He had been operated on in 1913 and 1915 and came to the hospital with a recurrence at the same time. As operation was refused, he was given roentgen treatment.

The third case also was treated with the roentgen rays. JUENGLING (Z).

Luepke, H.: The Operative Treatment of Diverticulum of the Œsophagus (Beitrag zur operativen Behandlung der Œsophagusdivertikel). *Beitr. z. klin. Chir.*, 1921, cxxi, 612.

Because of the hopelessness of internal treatment of diverticula of the Œsophagus there have been many attempts to treat the condition surgically. At first, operative treatment consisted merely in forming fistulæ in the diverticulum. Later, resection in two stages was done. Today, since the introduction of local anæsthesia, resection in one stage is the procedure of choice.

The author gives the histories of the last 4 cases operated on by Perthes in one stage. In all of these the fistula in the Œsophagus healed by first intention. The diagnosis of diverticulum generally offers no difficulties for the symptoms are very characteristic. However, it should be confirmed by an examination with the probe or by Œsophagoscopy. In most cases a roentgen examination gives sufficient information.

Local anæsthesia is a decided step in advance in the operative treatment. It overcomes the chief dangers of the operation, i. e., direct injury of the respiratory organs by the anæsthetic and the aspiration of bits of food from the diverticulum. Moreover, it facilitates the examination of the diverticulum as the patient can be asked at any moment to swallow and swallowing makes the diverticulum more prominent. In addition, the introduction of a probe is rendered unnecessary and the filling of the sac before the operation as recommended by Koenig is no longer dangerous as it can be emptied at any time. Another great advantage is that the anæsthesia is not followed by vomiting which puts a great strain on the Œsophageal sutures. The local anæsthesia induced by subcutaneous injection is supplemented by paravertebral conduction anæsthesia.

The incision used is a longitudinal incision made at the anterior edge of the sternocleidomastoid or a collar incision somewhat higher than that for goiter. The muscles of the neck are spared as much as possible; generally it is necessary to cut the omohyoid. The diverticulum is reached between the thyroid and the great vessels of the neck. The

latter must be drawn outward. It is necessary sometimes to ligate the superior or inferior thyroid artery, and if the thyroid is enlarged, to resect one pole. In removing the diverticulum Perthes places a Moynihan clamp on the neck of the diverticulum and cuts above it. A continuous suture is passed through the adventitia and muscularis while the clamp is in position. The sutures are tied just as the clamp is taken off. Afterward a few buried sutures are placed in the œsophagus.

In general it can be said that the best results are obtained when the mucous membrane stump, which offers danger of infection, is completely invaginated in the lumen of the œsophagus and the normal œsophageal wall is brought together over it. Complete closure of the wound is not indicated as, in spite of the utmost care in removing the diverticulum, healing of the external wound by first intention cannot be counted upon.

In the after-treatment the chief point is the patient's nutrition as he is generally in poor condition. As a rule, except when a gastric fistula is made, the patient is fed for the first few days by enema and infusions of salt solution. From the third to the fifth day a little liquid food is given by mouth. If the sutures are not disturbed the wound heals more quickly and no fistulæ are formed. Swallowing, however, is not as dangerous as vomiting. The

administration of nutriment through a stomach sound is not indicated as it causes retching. It would be better to make a stomach fistula, especially if the patient is weak and under-nourished.

The danger of infection has been met by different surgeons in different ways. Girard invaginates the unopened diverticulum into the œsophagus. This is not a radical treatment and is possible only if the diverticulum is very small. Goldmann prefers to remove the diverticulum in two stages. The sac is exposed, ligated with a silk suture at its insertion in the œsophagus, pulled outward, and sutured to the surface. The skin wound is closed around a tampon. If then the diverticulum is not discharged spontaneously after eight to ten days it is removed surgically. Of course in such cases a fistula is formed, but it is not dangerous as the granulations which form in the meantime are a sufficient protection to the surrounding tissues. Later examination, however, has shown that this method, which formerly was in favor, leaves small pouches of mucous membrane which may cause a recurrence later.

In resection of the diverticulum a drain or tampon should always be left at the point of suture. In general, it may be said that with modern surgical technique and under local anæsthesia resection is not associated with any special danger and is the only reliable surgical method. GANGL (Z).

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Dorendorf: The Diagnosis of Acute, Non-Suppurative, and Chronic Mediastinitis (Die Diagnose der akuten—nicht eitrigen—und der chronischen Mediastinitis). *Arch. f. Laryngol. u. Rhinol.*, 1920, xxxiii, 285.

The diagnosis of acute, non-suppurative mediastinitis is very difficult. The condition should be suggested by certain subjective symptoms associated with hiccup, difficulty in swallowing, and pain behind the sternum. The most important objective sign is paralysis of the recurrent laryngeal nerve on the left side. This is generally only a posticus paralysis. As it does not disturb the voice or respiration, it can be recognized only by a mirror examination.

The author observed such paralyzes in 4 cases of pleuritic effusion in which the inflammation extended to the mediastinum. In 2 of these it was very extensive, but in the others only moderate. In 1 case there was complete paralysis of the recurrent laryngeal nerve on the left side, and in 3 cases only a posticus paralysis. In 1 of these cases there was tuberculosis of the apex of the left lung. In every instance the paralysis disappeared completely.

In 2 cases there was paralysis of the left vocal cord after hydropneumothorax, and in both the apex of the left lung had collapsed when the paralysis began so that injury to the nerve from apical adhesions could be excluded. More rarely a paral-

ysis of the recurrent occurs in pleuropneumonia. Two cases were observed. In the case of a 64-year-old woman paralysis of the left recurrent laryngeal nerve developed three days after the beginning of pneumonia on the left side. Death occurred four days later. At autopsy only oedematous tissue was found pressing on the left vagus and recurrent laryngeal nerve; there was no pressure of swollen bronchial glands. In the second case there was paralysis of the left recurrent laryngeal nerve in the course of a pleuropneumonia of the upper and middle lobes in a healthy 24-year-old workman. The paralysis disappeared a few weeks after the resolution of the pneumonia.

More frequently paralysis of the recurrent laryngeal nerve occurs in the course of pericarditis in rheumatic polyarthritis in which the inflammation extends to the pleura and, less frequently, to the mediastinum. The conduction of the nerve is not interrupted in these cases by the mechanical pressure of the large pericardial effusion as the paralysis is observed in cases in which the exudate is moderate and even in those in which there is no effusion at all. It is rather the result of an inflammation extending from the pericardium to the loose lymphatic tissue of the mediastinum and involving also the left vagus. Paralysis of the recurrent laryngeal nerve associated with mitral lesions cannot be attributed to mechanical injury exerted by the enlarged left ventricle as in these cases, 10 of which were ob-

served by the author, it is much more probable that, in addition to the endocarditis which caused the mitral lesion, there was also a pericarditis which was responsible for the mediastinitis.

The prognosis is favorable in cases of paralysis of the muscles of the larynx occurring in acute articular rheumatism causing pericarditis. As a rule the condition disappears gradually in the course of four or five months. In rare cases, however, a chronic inflammation develops which produces permanent paralysis of the recurrent laryngeal nerve.

There are two types of cases of chronic mediastinitis. In the first, the process is limited to the mediastinum and is generally caused by tuberculosis; in the second, it involves the pericardium also and originates in a polyserositis or a rheumatic pericarditis. The symptoms are stasis of the veins of the neck and face, tortuous veins on the anterior wall of the thorax, oedema of the face, cyanosis of the lips, frequent nose-bleed, vomiting due to irritation of the vagus, dysphagia from traction and pressure on the œsophagus or branches of the vagus, increased pulse rate, unequal pupils, and paralysis of the left recurrent laryngeal nerve. The increased tension of the nerve tissue between the vessels and the trachea leads in many cases to pulsations of the larynx (pulsus laryngeus descendens). When the pericardium is involved the symptoms of pericardial adhesions and the heart injuries caused by them dominate the clinical picture. Finally there may be the complete clinical picture of "walling up of the heart" with all its consequences. The author gives the detailed history of such a case.

Roentgen examination often gives a positive diagnosis in cases of chronic mediastinitis; especially illumination in an oblique or transverse direction. Mediastinal adhesions are shown by a veil-like picture or by dark spots in the clear mediastinal field. Displacement of the trachea and aorta is a further indication of mediastinitis. Three roentgen pictures are given.

TIEGEL (Z).

Matthews, A. A.: Simple Drainage Device for Empyema. *Northwest Med.*, 1921, xx, 88.

The device described is used to obviate the danger of removing a large quantity of fluid from the chest at one time and to prevent the shock consequent to mediastinal flapping which occurs occasionally when the open drainage tube is employed. Negative pressure can be applied after a day or two if desired.

The author prefers resecting 2 in. of the ninth rib in the scapular line. A small opening is made in the pleura, a finger is inserted in the opening to prevent the escape of pus, and a pursestring suture then placed around the opening. A Wilson empyema button through which a close-fitting rubber tube has been passed is placed within the cavity and the pursestring drawn taut. The muscle and skin are snugly apposed and the outer flange of the Wilson button is strapped to the chest with adhesive plaster. The tube is clamped but every two hours as much pus as seems desirable is drawn off by turning the

patient on his side and releasing the clamp. After the second day Dakin's solution is injected through the tube several times each day except in cases of bronchial fistulæ.

In conclusion the author states that this method prevents shock, saves dressings, controls the amount of discharge, remains air-tight, and permits the application of negative pressure.

R. C. WEBB, M.D.

Pribram, B. O.: Hæmorrhage of the Mammary Gland (Die blutende Mamma). *Ergebn. d. Chir. u. Orthop.*, 1921, xiii, 311.

Bleeding from the nipple always indicates irritation. In young girls it is generally a vicarious menstruation associated with changes in the genitalia. As such it is harmless and does not require any treatment except perhaps bandaging of the breasts and gynecological treatment to bring about normal menstruation.

When bleeding of the nipple appears between the ages of 40 and 50 it is generally due to polycystic degeneration of the mammae. This, the author believes, is due to unequal aging in different parts of the gland, which leads finally to cyst formation. The epithelium of the milk ducts secretes and thereby causes pressure from within outward. The pressure gives rise to cysts which continue to grow until the walls break down and then become confluent. These cysts also may give rise to hæmorrhage.

Hæmorrhagic intracanalicular cystic epithelioma is distinguished from these polycysts (Reclus' disease) by the fact that the former always originates in the large milk ducts and therefore always causes hæmorrhage through the nipple and papillary excrescences. Moreover, it has a greater tendency to develop into carcinoma. Both forms of cystoma, however, have a certain tendency to degenerate into carcinoma.

Carcinoma and sarcoma of the breast seldom bleed. Cases in which bleeding occurs are generally cases of cystic tumors. These are less malignant and their treatment, for cosmetic reasons, may be more conservative. In polycystoma some surgeons puncture the cysts and, after removing their contents by suction, inject phenol glycerine, iodoform ether, or tincture of iodine. Hyperæmia must be avoided because it causes pain and makes the condition worse. If drainage of the cysts is not effective an infra-mammary incision is made around the gland and the gland is laid back and examined from below. The large cysts are then excised and the small ones cauterized with the thermocautery. If the distribution of the cysts is too general or if there is a cystic epithelioma of the large milk ducts, the entire gland is shelled out, the skin and nipple being left. By the implantation of fat a very good cosmetic result is obtained.

The neighboring lymph glands in cases of cystic epithelioma, as in cases of cancer, show only inflammatory hyperplasia. They are not invaded by

metastases. Therefore it is not necessary to remove them. In cases of carcinoma or sarcoma the classical operation is amputation with radical removal of the regional glands. In one case of inoperable carcinoma the author obtained a good result from radiotherapy and oophorectomy. The tumor decreased in size and the patient's general condition improved. This treatment, therefore, should be tried in inoperable cases. ROSENBERG (Z).

TRACHEA AND LUNGS

Mollison, W. M.: Dyspnoea and Tracheotomy.
Guy's Hosp. Gaz., Lond., 1921, xxxv, 108.

In considering the causes of dyspnoea, general diseases as well as local conditions must be borne in mind. The general diseases favoring dyspnoea are affections of the lungs, heart, kidneys, and nervous system. The author discusses in greater detail the local affections which cause dyspnoea by preventing the entrance of air into the lungs.

First mentioned is obstruction of the air and food passages due to foreign bodies, dropping back of the tongue, acute parenchymatous glossitis, abscess of the tongue, and abscesses and growths of the posterior pharyngeal wall. Next discussed is obstruction of the air passages alone from the outside, within the lumen of the passages, or in the walls of the tubes.

Obstruction of the air passages from the outside may be due to garroting, strangling, and pressure caused by such conditions as an enlarged thyroid, a retrosternal adenoma, malignant glands, mediastinal tumors, masses of tuberculous glands, or an enlarged thymus.

Obstruction within the passages may be due to foreign bodies, including blood and pus.

Obstruction due to affections of the walls of the passages themselves may be caused by webbing of the vocal cords, congenital laryngeal stridor, laryngismus stridulus, inflammatory affections such as acute catarrhal, diphtheritic, or pneumococcal laryngitis, or papillomata.

In summing up the indications for tracheotomy as a means of combating dyspnoea, Mollison states that it should never be performed for laryngismus stridulus and should not be necessary in cases of papilloma of the larynx or cases of congenital laryngeal stridor. In cases of webbing of the cords tracheotomy may be indicated as a preliminary to other treatment, but is seldom required as an emergency operation.

In no case of diphtheria should the surgeon be in a hurry to perform a tracheotomy. Instead, he should give large doses of antitoxin, then chloral and bromide by rectum, place the child in a warm bath, give oxygen, and then wait for an hour or two. If tracheotomy is necessary, it should be done as low down as possible and the tube should be removed at the end of twenty-four hours or three days at the longest. Before the removal of the tube chloral and bromide should be given. O. M. ROTT, M.D.

Sauerbruch, F. The Surgical Treatment of Pulmonary Tuberculosis (Die chirurgische Behandlung der Lungentuberkulose). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 261.

Sauerbruch has found operative treatment beneficial in severe cases of pulmonary tuberculosis, especially those in which the condition is unilateral. In discussing his results, he points out the limitations of pneumothorax treatment which are often not recognized because it is not a serious operation, and he warns against the danger of breaking down adhesions.

In mild cases pneumothorax is unnecessary and in others its permanent effects have been overestimated. Complications from exudates are not unusual. Experienced surgeons are coming to realize more and more that extensive rib resection is the best method of obtaining extrapleural constriction of the lung. When there are extensive adhesions of the lung to the chest wall the resection may extend from the first to the eleventh ribs, but if the lower lobe of the lung is freely movable resection may be supplemented by pneumothorax. This method is better than Jakobaeus' intrapleural pneumolysis, in which, by the use of the thoracoscope, the adhesive bands are cut with the cautery. As such bands may contain blood vessels and small bronchi, their resection may be followed by hæmorrhage and infection of the pleural cavity. By extrapleural loosening of adhesions combined with pneumothorax or rib resection astonishingly good results are often obtained.

Fillings are used only in cases of healed tuberculosis in which cavities have been formed and mechanical plugging is indicated. In the forms of tuberculosis in which there are rigid-walled cavities which cannot be sufficiently filled up by mechanical compression of the lung it is best to open the cavities and empty their contents. This should be preceded by rib resection.

Artificial paralysis of the diaphragm is of little value in the treatment of pulmonary tuberculosis, but Sauerbruch uses it frequently for diagnostic purposes when foci are suspected in the other lung and it is not known whether the other lung would be able to withstand any further burden. He advises against serious operations when, after section of the phrenic nerve, there is fever and an increase of physical findings on the opposite side. He disapproves of the surgical treatment of pulmonary tuberculosis by the methods of Freund, Hart, and Harras. With regard to the indications for operation he repeatedly emphasizes the necessity for close co-operation between the surgeon and internist.

Of 381 patients operated on for pulmonary tuberculosis up to 1919, 35 per cent are practically cured and about 40 per cent are considerably improved. All of these patients had severe chronic forms of tuberculosis. The permanent results were as good in working people who went back to their work after operation as in the wealthier classes. Numbers of soldiers were restored to health.

In the author's opinion it would be a good thing to establish sanatoria for the surgical treatment of severe but still curable cases of tuberculosis similar to those which have been established for the medical and hygienic treatment of milder cases. These would keep the patients from infecting their families and friends while they were being restored to health.

WAGNER (Z).

Del Marcelle, C. C.: Penetrating Wounds of the Chest. *J.-Lancet*, 1921, xli, 229.

The author discusses the immediate treatment of penetrating wounds of the chest as they occur on the battlefield and during the first hour or two after injury. All foreign bodies which were easily accessible were removed at once. In cases of perforating wounds of the chest which were not sucking wounds the side involved was strapped and morphine and atropine were administered.

In sucking wounds of the chest with large openings there was extreme danger if the wound was as large as the larynx. In these cases there was always a certain degree of shock due to mental and physical fatigue and hæmorrhage. To control the hæmorrhage the author advocates pinning up the wounds with one or more safety pins, the bite including the skin and muscle, and then applying a gauze dressing. This method was employed in France in July, 1918, the enlisted men using the pins from their first-aid packets.

When the patient had been moved to suitable surroundings sucking wounds were excised under local anæsthesia and closed with deep mattress sutures. Morphine and atropine were given, and fluids as indicated. Heat was applied from emergency stoves. As soon as possible the patient was sent back to an evacuation hospital. Under this treatment the mortality was 14 per cent.

At a base hospital in France 50 per cent of the chest wounds developed hæmothorax, and of these, 38 per cent developed empyema. Hæmothorax was treated by aspiration. In empyema the foreign bodies were removed and tubular drainage was instituted. In 70 per cent small sinuses developed.

In most of the cases with fracture of the ribs an infection developed and 52 per cent of the patients died.

R. C. WEBB, M.D.

HEART AND VASCULAR SYSTEM

Matas, R.: The Routes of Access to the Heart: Lessons Gathered from the Experiences of the World War. *Med. Rec.*, 1921, xcix, 595.

The lessons from the world war which have a direct bearing upon the surgery of the heart in general and upon the extraction of foreign bodies in particular may be summarized as follows:

1. The indispensable association and collaboration of the roentgenologist with the surgeon.

2. The proved efficiency of this collaboration in increasing the safety of the intrathoracic manipulations and procedures for the extraction of foreign

bodies which hitherto have been regarded as largely impracticable if not visionary.

3. Modifications in the technique of thoracotomy utilizing the older suggestions and the revision and extension of methods in the light of a new and larger experience.

4. Disregard of the pleura and the risks of acute surgical pneumothorax contrary to all preconceived notions of the gravity of this complication.

The routes of access by which the heart can be made accessible to surgical manipulation in all its parts are reviewed. Even among experienced operators they vary greatly. Le Fort makes a large fenestra by cutting a trap-door osteoplastic flap which includes the cartilages from the third to the fifth ribs to the left of a sternum. The Duval-Barsty operation is a median thoraco-abdominal pericardiectomy. Petit de la Villéon searches for intrathoracic projectiles under the fluoroscopic screen and extracts them through a small button-hole opening.

Matas believes the indications for operations must be based upon the patient's condition and the degree and duration of his disability.

E. C. ROBITSHEK, M.D.

Pool, E. H.: Pericardiectomy for Suppurative Pericarditis. *Ann. Surg.*, 1921, lxxiii, 393.

The author reports one case of suppurative pericarditis of his own and several from the literature which were treated by pericardiectomy. In a total of 99 cases, which include 86 collected by Rhodes in 1915, recovery resulted in 53 and death in 46.

The author suggests the following operation, a modification of that of Delorme and Mignon, in cases of suppurative pericarditis:

The incision is begun at the middle of the sternum at the level of the lower margin of the fourth costal cartilage, passed to the left and downward to the upper margin of the chondrosternal junction of the fifth, then downward close to the left of the sternum to the middle of the seventh cartilage, and outward following the seventh. The seventh cartilage is divided at the sternum, fractured 2 in. from its sternal end, and removed. The same procedure is carried out on the fifth and sixth cartilages. The thin layer including the internal intercostal muscles and the posterior perichondrium is incised vertically and retracted. The exposed internal mammary vessels are ligated. The triangularis sterni, the underlying fat, and with it the edge of the pleura, are displaced outward. The pericardium thus exposed is opened between forceps. If possible, the edges of the pericardium are sutured to the skin or the superficial soft parts to diminish the danger of mediastinitis. Carrel tubes are then inserted and Dakin's solution is introduced at regular intervals.

According to the author, suppurative pericarditis is not a rare lesion. As a rule the involvement of the pericardium is secondary to a general sepsis, but of course may follow infection from without through a wound or occur primarily. The chief reason why

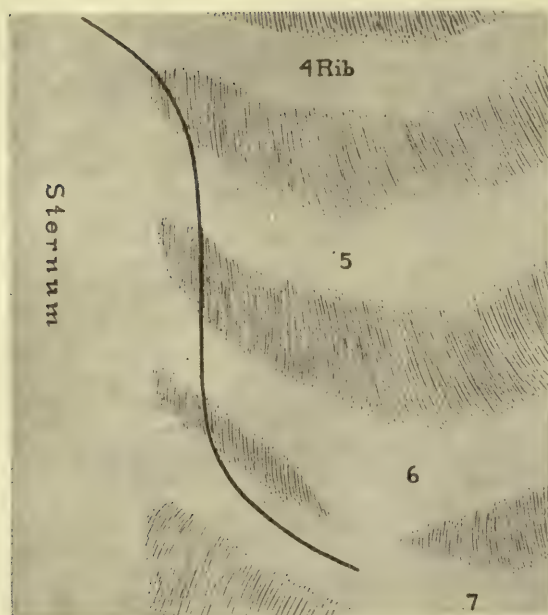


Fig. 1. Incision for pericardiotomy.

the condition is frequently overlooked is that it is not borne in mind in the examination and its signs are not sought.

The case reported by the author was that of a 9-year-old boy who, following an attack of bilateral pneumonia, was admitted to the hospital with empyema on the right side and suppurative pericarditis. A thoracotomy and pericardiotomy were performed as here described. After the second day the Carrel-Dakin technique was established for the treatment of the pericardium. The patient left the hospital in excellent general condition two months after the operation.

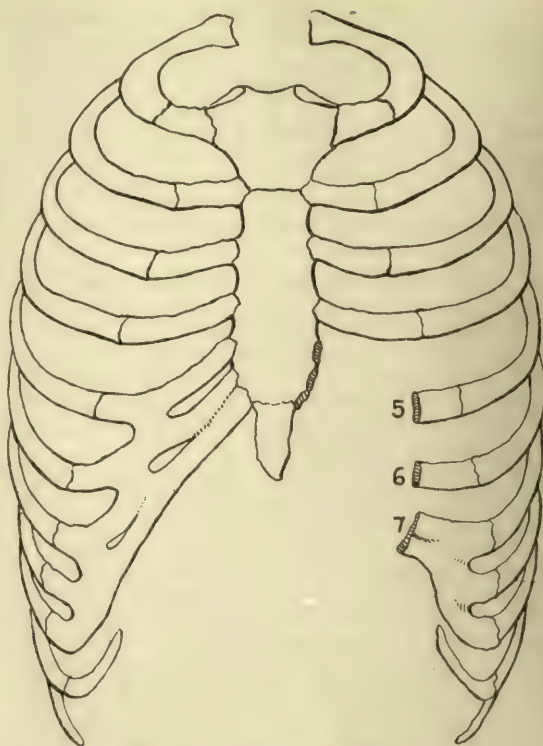


Fig. 2. Exposure after removal of fifth, sixth, and seventh cartilages.

An interesting change in the electrocardiograph was noted. A month after the operation the "T" wave was turned downward in all three leads. About a month later, when the wound had closed and the patient was up and about, it no longer showed the inverted direction.

R. B. BETTMAN, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Sheen, A. W.: Recurrent Hernia: The Operations for Its Cure. *Lancet*, 1921, cc, 746.

As a result of operative experience with many recurrent herniæ the following conclusions are made with regard to this condition:

1. In indirect hernia the usual cause of recurrence is non-removal of the deeper part of the sac.
2. An occasional cause of recurrence is failure to find a small sac.
3. Some recurrences are due to a direct hernia.
4. Occasionally a primary indirect hernia is cured and a direct hernia is overlooked or develops subsequently.

No major operation is more frequently done than an operation for the cure of hernia. As every surgeon

is operating for recurrences, their total number must be great. Operation for hernia demands technical knowledge and skill and should not be attempted by anyone without experience. In every case it must be determined whether the hernia is indirect or direct. The sac is most conveniently picked up at the internal ring. The external oblique aponeurosis is incised for 3 or 4 in. from the external ring and the flaps are turned back. The internal coverings of the cord are opened and the internal oblique is divided in the line of the canal for about 1 in. If a sac is found the outermost part of the neck is reached without retraction. The sac is isolated by splitting the coverings and dissecting them free. It is then opened and, with a finger inside, is pushed forward against the peritoneum and transversalis fascia on the inner side of the deep epigastric vessels.

This demonstrates the size of a direct hernia and the width between the conjoined tendon and Poupart's ligament. The external oblique is closed with the cord in its natural position.

The Bassini operation, in which the cord is left beneath the skin, is performed in cases of definite direct hernia or a large gap between the conjoined tendon and Poupart's ligament. Sometimes it may be necessary to put a wire filigree in the transversalis fascia. A case history illustrating this type of procedure is reported with comments.

MERLE R. HOON, M.D.

Neudoerfer, A.: The Ether Treatment of Peritonitis (Zur Frage der Aetherbehandlung der Peritonitis). *Zentralbl. f. Chir.*, 1921, xlviii, 2.

The author gives a brief report of 22 cases of peritonitis treated by instillations of ether. There were 17 recoveries and 5 deaths. Of the patients who recovered, 9 were in a very desperate condition when they came to operation.

Among those who died 3 had recovered from the general peritonitis. One died from a secondary abscess, and another from pneumonia, three weeks after the first operation. In a third case death was due to a severe phlegmon of the floor of the mouth.

A striking fact was the number of secondary abscesses. These developed in 6 cases. The abdominal cavity was drained in every instance. In only 1 case was the ether treatment a complete failure. The author believes he is justified by his results in recommending the ether treatment.

NEUPERT (Z).

GASTRO-INTESTINAL TRACT

Vernet, S. G., and Gallart-Monès, F.: A New Nerve Connection Between the Digestive and Genito-Urinary Organs (Nouvelle communication nerveuse entre les organes des appareils digestif et génito-urinaire). *Arch. de mal. de l'appar. digest.*, 1921, xi, 105.

It has been known for some time that in carnivora there is a nerve ganglion in the median line near the origin of the inferior mesenteric artery. In comparative anatomy this ganglion is known as the "inferior mesenteric ganglion." Bellido and Seres called it the "vesicorenal ganglion" because of the important part it plays in the renovesical reflexes which are so important in urinary pathology. This term, however, does not cover all its functions.

Believing that a similar ganglion must be present also in man, Vernet and Gallart-Monès sought for it in the dissection of cadavers. They found it in a human fetus. This dissection showed that there is a direct nervous communication between the kidney and bladder and between all the organs of the genito-urinary tract and the part of the intestine supplied by the inferior mesenteric artery. The ganglion is fusiform, 5 mm. long and 2 to 3 mm. wide. It is situated on the median line at the anterior surface of the aorta near the origin of the inferior mesenteric artery, about 5 mm. beneath the renal pedicle,

immediately under the peritoneum, and between the peritoneum and the anterior surface of the aorta. The nerve filaments from it anastomose above with those of the renal plexus and frequently with the posterior renal ganglion. Below, they join those of the bladder, uterus, and ovaries in the female, and those of the prostate, seminal vesicles, and possibly the testicles and penis in the male. In the adult the numerous anastomoses of this ganglion with neighboring ganglia make its differentiation difficult.

The authors believe the ganglion described is the center of vesicorenal, renorenal, urogenital, renointestinal, and other nerve reflexes. W. A. BRENNAN.

Savignac, R., and Alivisatos, A.: A Contribution to the Study of Gastric Ulcer of the Tabetic Type (Contribution à l'étude de l'ulcus gastrique à forme tabétique). *Arch. de mal. de l'appar. digest.*, 1921, xi, 73.

Among the atypical forms of gastric ulcer a place must be given to ulcer of the tabetic type. This type is characterized by crises of generally violent pains and irrepressible vomiting, beginning and terminating suddenly, which are separated by periods in which the patient feels almost entirely well. The subjective syndrome may be confused with that of true tabetic gastric crises to which it bears a striking resemblance. It is differentiated from it by the absence of tabetic symptoms and of a syphilitic history, and especially by its objective signs of ulcer (X-ray findings, occult hæmorrhages, the findings of a study of the gastric juice) and the influence of treatment on the crises themselves and the evolution of the condition.

As a rule the syndrome is due to a chronic ulcer of the lesser curvature of the stomach which, because of its long duration and its situation, has set up lesions resembling those of chronic neuritis. The differentiation of the condition from tabetic crises is of importance as the treatment of ulcer of the tabetic type must be more strenuous and prolonged than that of other types of ulcer and surgical operation is more often necessary. The author cites a number of illustrative cases. W. A. BRENNAN.

Deaver, J. B., and Pfeiffer, D. B.: Gastro-Enterotomy in Acute Perforated Ulcer of the Stomach and Duodenum. *Ann. Surg.*, 1921, lxxiii, 441.

As in cases of perforated ulcer excision ordinarily offers nothing of immediate life-saving value to compensate for the added time and trauma of the operation, the authors have never advocated it even though there are many early cases in which it might be performed very safely. Concerning simultaneous gastrojejunostomy there is as yet no general agreement.

The statistical study in this paper is based on 55 cases of perforated ulcers, 4 of which were fatal. Only 1 of the patients was a female. Seventeen of the ulcers were gastric and 38 were duodenal. Eighty per cent developed between the ages of 25 and 45,

and 40 per cent in the fourth decade. The ages of the patients ranged from 20 to 61 years.

Perforation was the first symptom noted in about 20 per cent of the cases. At the moment of its occurrence there was excruciating pain. This was followed promptly by abdominal rigidity which was board-like in character. There was initial vomiting in nearly every case.

The abdominal rigidity was associated with tenderness which was most marked over the most rigid area. The greatest rigidity was usually in the epigastric region, though later the lower abdomen, particularly on the right side, become as spastic as the upper zone.

True shock was seldom observed. In many cases reaction had occurred when the patient was examined and the temperature, pulse, and respiration were but little disturbed. The diagnosis therefore depended chiefly upon the history and the abdominal signs. This was the so-called latent period noted in cases of perforating ulcers.

At the time the patients were admitted to the hospital the temperature range was from 96 to 100.4 degrees F. The pulse varied from 64 to 152, the average being 92, and the respiration varied from 20 to 40, the average being 31. The leucocytes varied from 2,900 to 25,750. In the few fatal cases the count was below 10,000. It would seem, therefore, that a low leucocyte count with a low percentage of polynuclears is usually an unfavorable sign. The longer operation is deferred the higher the mortality.

There has been much discussion regarding the dangers of infecting the lesser peritoneal cavity by opening the transverse mesocolon for the performance of gastro-enterostomy but no case has been reported in which it seemed probable that this occurred. Moreover, as the authors pointed out years ago—a fact since verified by others—much of the exudate which is poured out so copiously in these cases is in reality sterile or relatively sterile, being a response to the chemical irritation of the gastric and duodenal contents rather than the result of bacterial inflammation. In the cases reviewed 34 cultures of the fluid in the peritoneal cavity were made; 23 were sterile and only 11 positive.

The authors conclude that it is not wise to insist upon making a gastro-enterostomy in the presence of shock or evident systemic toxæmia. While these conditions are not common within the first twelve hours after perforation, they do occur in some instances. In properly selected cases, however, this operation does not increase the primary mortality and there is good reason to believe that it decreases the mortality and promotes convalescence.

I. W. BACH, M.D.

Frank, L.: A Brief Review of the End-Results in the Surgery of Gastric and Duodenal Ulcers. *Am. Med.*, 1921, n. s. xvi, 184.

The author reviews the experiences in gastric and duodenal surgery of different surgeons, including his

own, and calls attention to the difficulty in correlating the statistics of different men. In the opinion of W. J. Mayo, ulcer of the stomach is more serious than ulcer of the duodenum. Fortunately it is less frequent.

Deaver states that, other things being equal, excision of the ulcer or resection followed by gastro-enterostomy is the procedure of choice when surgical treatment has been decided upon for the relief of gastric or duodenal ulcer. According to Frank, the end-results in cases of gastric and duodenal ulcer are not entirely satisfactory. He calls attention to the errors of judgment which are not infrequently made in the diagnosis. At the Rochester clinic the records show that more than 300 gastro-enterostomies have been released in cases in which there was no evidence, either in the history or the condition found at the second operation, that an ulcer had ever been present. The way to avoid error is to trust to no one factor in the examination but to base the diagnosis on the history, the findings of the physical, laboratory, and fluoroscopic examinations, and roentgenograms taken together.

In advocating cautery excision Balfour gives the following conclusions: (1) the ulcer is destroyed and with it any early malignancy which may be present, (2) there is little sacrifice of sound gastric tissue and secondary contraction is therefore minimized, (3) hæmorrhage early or late is prevented with practical certainty, and (4) the procedure is simple, rapid, and safe.

The frequency of malignant degeneration is much disputed. The important point to remember is that in actual practice it is much safer to regard every one of these lesions as potentially malignant. The method of treatment should then be obvious, and whatever else it may do it will effect a thorough removal of the lesion. So many seemingly benign lesions of the stomach ultimately prove to be malignant that the advisability of any form of medical treatment in such cases seems to be increasingly questionable.

The conclusions drawn by the author are summarized as follows:

1. Gastric and duodenal ulcers are distinctly amenable to surgical treatment and are best handled surgically.

2. In from 75 per cent to 85 per cent the results of surgical treatment are very satisfactory to the patient.

3. Many of the failures to relieve completely are due to delay in surgical intervention.

4. Failures are due also to incorrect diagnosis and the performance of gastro-enterostomy when no ulcer is present, the cause of the digestive disturbances being other than ulcer.

5. In the presence of ulcer, failure to cure may be due to imperfect technique or an incorrect type of operation whereby the way is left open to postoperative complications or sequelæ such as jejunal ulcer and carcinomatous engraftment upon the ulcer.

FREDERICK CHRISTOPHER, M.D.

Davis, B. B.: *The Comparative Results of Pyloroplasty and of Gastro-Enterostomy in Stomach Surgery.* *Ann. Surg.*, 1921, lxxiii, 450.

From 15 to 40 per cent of the operations now done for gastric ulcer are failures. At least they do not restore the patient to sound health. Moynihan claims that many of the poor results following gastro-enterostomy have been due to the performance of the operation in the absence of any organic lesions justifying it; the presence of chronic extra-gastric lesions which have been overlooked; incompleteness of operation, the ulcer not having been dealt with; and defects in the technique.

The symptoms complained of by patients who have not been cured are pain, vomiting, hæmorrhage, and diarrhœa. The author states that these symptoms are frequently due to altered physiology, the stomach emptying at a point more or less remote from the general direction of the peristaltic wave and the gastric contents entering the intestine at a point not physiologically adapted to the function thus forced upon it.

Pain may be due to forcible peristalsis against a closed pylorus, recurrent or unhealed ulcers, or jejunal ulcer. Colic and intestinal soreness are a frequent result of the rapid entrance of coarse unchymified food into the jejunum as this material is usually highly acid, not having been neutralized by the alkaline bile and pancreatic juice.

The causes of hæmorrhage are usually the same, regardless of the type of operation, but one very frequent cause, jejunal ulcer, is a direct result of gastro-enterostomy.

Vomiting may be caused by obstruction due to a kink of the efferent loop of the jejunum. In such cases bile and pancreatic juice enter the stomach through the artificial stoma. Reflex vomiting occurs as the result of a severe colic produced by the rapid filling of the small intestine when the stomach empties too rapidly.

Diarrhœa, which frequently follows gastro-enterostomy is probably due as a rule to too rapid emptying of the stomach. The food which enters the jejunum is not well mixed with the gastric juice, and little, if at all, with the bile and the pancreatic juice. Under such circumstances normal digestion is impossible, the food acting merely as a foreign body and an irritant to the intestinal mucosa.

On the basis of the physiological facts it would appear that the rational manner of dealing with the problem would be excision or cauterization of the ulcer and the enlargement of the natural outlet to secure free emptying of the stomach.

The operation of pyloroplasty as done by Finney seems to meet all the requirements. The size of the opening may be as small or large as seems essential to meet the needs of the case. It is necessary only to make an opening large enough to function easily after the narrowing which comes with the decrease in size of a dilated stomach.

In some cases the conditions are unfavorable for pyloroplasty. Such are those in which there are

dense massive adhesions about the pylorus and duodenum which would render this operation difficult and dangerous and postoperative obstruction probable; also those in which the region of the pylorus is greatly thickened and infiltrated.

The main objections to gastro-enterostomy are summarized as follows:

1. Peristalsis carries the chyme past the gastro-enterostomy opening forcibly against the pylorus and whatever passes through the artificial stoma leaks through following the law of least resistance.

2. Much of the material which reaches the jejunum is unprepared; its chymification is incomplete as it is not yet thoroughly mixed with the gastric juice, the bile, and the pancreatic juice.

3. Because of these facts, digestion is imperfect and incomplete, the intestinal mucosa is irritated and often greatly inflamed, an abnormal amount of gas is present, and the patient suffers from colic, diarrhœa, and lowered nutrition.

4. Jejunal ulcer, a much worse lesion than the original condition for which the operation was done, is often a direct result of this unphysiological procedure.

5. The amount of secretin produced in the jejunum is less than normal, and probably also the amount of pancreatic secretion, when all of the stomach contents enter directly into the jejunum.

6. A large meal completely filling the stomach will so stretch the stomach side of the gastro-enterostomy stoma that the distal side of the jejunum may shut down against the opening like a lid and prevent the stomach contents from entering the jejunum.

Pyloroplasty does not have these objections and permits the digestion to go on normally. The opening is in the regular path of the peristaltic wave. Even when the sphincteric action of the pylorus is destroyed, the rhythmic segmentation of the powerful duodenum will prevent the stomach from emptying too rapidly.

It is the author's opinion that active ulcers are better dealt with by excision or, better still, by cauterization as worked out by Balfour. In operating on ulcers it is of importance to remove the focus of infection from which they had their origin. The gall-bladder and appendix are always to be regarded with suspicion and no operation is complete until these organs have been inspected carefully and removed if they are not normal.

I. W. BACH, M.D.

Frankenthal, L.: *Disinfection of the Mucous Membrane with Iodine by Payr's Method in Operations on the Stomach and Intestine* (*Die Bedeutung der Schleimhaut-Jodierung nach Payr bei Magen- und Darmoperationen*). *Beitr. z. klin. Chir.*, 1920, cxx, 614.

In intestinal operations there is always the danger of fatal peritonitis due to infection of the wound when the intestine is opened. In 1909 Payr introduced the method of painting the mucous mem-

brane of the intestine with a 5 per cent solution of iodine. Objections have been raised to this method as Fieber observed necrosis following its use.

In bacteriological examinations made after the application of the iodine Fritzsche found a marked decrease in the bacteria, even to complete sterility. Frankenthal made similar experiments. He thoroughly sponged the mucous membrane of the opened stomach or intestine, then rubbed it with a sponge dampened with iodine, and after five or ten minutes transferred material from it to different kinds of nutritive media. Forty-two cases were examined in this way. In 67 per cent the iodine had produced sterility, and in 33 per cent the number of bacteria was decreased. The results are tabulated.

By different methods, such as care of the mouth, withholding food, and irrigating the stomach, the pathogenic bacteria in the upper part of the intestine may be decreased, but in the lower parts of the colon, where the bacterial flora is most abundant, nothing can be done. It is here that the use of 5 per cent iodine solution for disinfection is of the greatest value. The solution should not be allowed to touch the serosa, however, as it tends to cause adhesions. Intoxication from the iodine has never been observed.

BRUENING (Z).

Perez, G.: Primary Sarcoma of the Small Intestine; Considerations Regarding Neoplastic Metastases (Sarcoma primitivo dell'intestino tenue; alcune considerazioni sulle metastasi neoplastiche). *Arch. ital. di chir.*, 1921, iii, 181.

The patient was a man 37 years of age who had suffered from gastritis for ten years. About three years before he was examined by the author pain began in the lumbar region and there was some digestive disturbance. A month previously a tumor was felt in the lower left quadrant of the abdomen. Since then this growth had increased in size very rapidly and at the time of examination was as large as two fists. On its surface a number of small, roundish excrescences were palpable. The diagnosis made was sarcoma of the mesentery or the small intestine without clinically appreciable metastases at a distance. Operation revealed a tumor in the small intestine with voluminous metastases in the mesentery. Histological examination showed the growth to be a round-celled sarcoma.

Perez states that the great richness of the lymphatic network along the edge of the intestine and mesentery explains why a malignant growth of the intestine invades the lymphatic system from the very beginning and why sarcoma of the intestine, unlike sarcoma of other tissues, involves the lymphatics before it contaminates the blood stream.

In the case reported, metastases were confined strictly to the nearest lymphatic glands of the mesentery; no other foci could be found. The operation was a mesenteric resection and removal of the sarcomatous tract of the intestine. It was done in 1913. As the patient's health has been excellent ever since, Perez believes that if small and undis-

covered metastatic foci had been present in the deep mesentery or some other region the removal of the primary focus caused their regression. Several cases of this kind have been reported in the literature.

The case is of interest because it shows that even when a sarcomatous tumor has formed large mesenteric metastases permanent recovery is possible. Early diagnosis and thorough mesenteric resection, however, are essential for this result.

W. A. BRENNAN.

Cohen, M.: Postoperative Recurrence of Intussusception. *Am. J. Dis. Child.*, 1921, xxi, 410.

This article contains a report of cases of postoperative recurrence of intussusception and a review of the literature. The author believes the condition occurs infrequently. In a series of 41 cases a postoperative recurrence developed in 4 after an interval of ten months, thirty hours, four months, and fourteen months respectively. Fourteen of these 41 patients died. One left the hospital, the parents having refused to allow the child to remain for operation. Twenty-six patients were discharged as cured. The conclusions arrived at are:

1. Repeated attacks of intussusception in persons previously operated on for the same condition, although very unusual, are not as infrequent as might be believed.

2. When an acute abdominal condition develops in a child who has been previously operated on for intussusception the possibility of recurrence must be considered.

3. The fact that most of these cases of intussusception are of the ileocecal type suggests very strongly that an anatomical factor is a predisposing cause and that some operative procedure should be devised to prevent recurrence.

A. R. HOLLENDER, M.D.

Ruben, M.: A Case of Subserous Lipoma of the Colon Transversum Incarcerated in the Sac of an Umbilical Hernia. *Acta chirurg. Scand.*, 1921, liii, 339.

The author has been able to collect 13 cases of subserous lipoma of the colon and to these he adds 2 cases of his own. He discusses the frequency of these growths, the ages at which they have been found, and their localization, size, and clinical complications. The 15 cases are summarized in a chart which gives the name of the author reporting the case, the year it was reported, the patient's sex and age, the localization, number, size, and shape of the growths, the duration of the symptoms, the course and complications of the condition, and the treatment and results. In Ruben's opinion his statistics show that the subserous lipomata, which on the whole are less common than the submucous lipomata, may give rise to fatal complications and therefore demand surgical intervention.

E. C. ROBITSHEK, M.D.

Einhorn, M.: A New Intestinal Tube, with Remarks on Its Use in a Case of Ulcerative Colitis.
Am. J. M. Sc., 1921, clxi, 546.

The tube described consists of an ordinary duodenal tube the distal end of which is provided with a metal fitting and a female thread. Several tubes of the same caliber as the duodenal tube and 1 meter long are provided with tiny metal fittings at both ends, on one side having a female thread and the other a male thread. The distal end of the new tube is formed by a piece of rubber tubing, 20 to 25 cm. long and about 20 F. caliber, and containing on its proximal side a metal fitting with a male thread and on its distal side a stopcock.

A jointed tube is formed thereby which may be placed at will. This jointed tube permits aspiration at 1 and sometimes 2 meter lengths, thus making it possible for the clinician to ascertain the position of the capsule in the duodenum and facilitating its introduction. Each subsequent length of tubing is added when its predecessor has entered the digestive tract.

In order to prevent the curling up of the tube within the stomach too much tubing should not be allowed to enter the stomach while the patient is eating, and the position of the tube should be ascertained before another length is added. The latter may be done by pulling the tube a short distance from the mouth and noting if there is any resistance. At this point a roentgen-ray examination is advantageous as it shows the course of the tube more exactly. The use of the X-ray is necessary also to show whether the cæcum has been reached in cases in which it is desired to apply treatment to the colon.

By means of the jointed intestinal tube a probable case of ulcerative colitis has been successfully treated by lavage of the colon from above. This case is reported in detail. I. W. BACH, M.D.

Stretton, J. L.: Carcinoma of the Large Intestine.
Brit. M. J., 1921, i, 555.

The author reports five cases of carcinoma of the large intestine operated on within a period of eighteen days. In three, the cæcum was involved; in one, the hepatic flexure; and in one, the pelvic colon. Two were not diagnosed previous to operation.

Early exploration should be done without loss of time in multitudinous examinations, medical treatment, etc. Whenever possible, the tumor should be completely resected with at least 4 in. of bowel on either side. An end-to-end anastomosis should then be done with linen thread. If it is impossible to resect, a short-circuiting operation may be performed instead of colostomy.

In conclusion the author makes the following statement: "If abdominal pain with irregularity of the bowels which is persistent for more than twelve months were looked on as sufficient to justify an exploratory operation, many of these conditions would be disclosed before it is too late to eradicate them."

R. NICHOLS, M.D.

Mayer and Uhlmann.: Sensitiveness to Percussion and Hyperæsthesia of the Skin in the Differential Diagnosis Between Appendicitis and Diseases of the Adnexa (Ueber Klopfempfindlichkeit und Hauthyperæsthesie zur Differentialdiagnose von Appendicitis und Adnexerkrankungen). *Med. Klin.*, 1921, xvii, 196.

In all cases of ulcerous or inflammatory processes of the abdominal cavity tests should be made to determine sensitiveness to percussion and hyperæsthesia of the skin. A clear distinction should be made between the linear hyperæsthesia of the skin on the back along a line corresponding to the intercostal spaces, which is most marked between the long muscles of the back and the scapular line, and the superficial abdominal hyperæsthesia of the skin which is of significance in the differential diagnosis between appendicitis and diseases of the adnexa.

In appendicitis the zone of pain which can be demonstrated by sensitiveness to percussion and hyperæsthesia of the skin is located typically at McBurney's point. Its size varies, being dependent on the degree of the inflammation. In appendicitis McBurney's point lies in the middle of the painful zone, and it is characteristic of the condition that the boundaries of the zone are a few finger-breadths from the midline and the groin. In adnexal disease the painful zone reaches to the midline and the groin. In appendicitis the zone is more nearly round, while in adnexal disease it is often a transverse oval and runs upward in a more nearly straight line. In acute disease of the adnexa it is almost always bilateral, although it may differ in intensity on the two sides. Therefore in cases of abdominal pain on the right side it is important to know whether an irritable state can be demonstrated on the left side also. Mild degrees of such a condition can be demonstrated more surely by percussion of the skin than by any other method.

The dorsolinear hyperæsthesia of the skin is often completely lacking in appendicitis, but is only rarely absent in acute disease of the adnexa. In adnexal disease there are also bilateral hypersensitive zones of skin running straight or obliquely downward from the tenth to the twelfth dorsal segments, i.e., from the level of the first lumbar vertebra to the first third of the sacrum. TROMP (Z).

Descomps, P.: Retrocolic Appendicectomy (L'appendicectomie rétrocolique). *Rev. de chir., Par.*, 1921, xl, 20.

In about one case out of every five the appendix is in a posterior, retrocolic position. This situation renders appendicectomy difficult.

The author gives a number of illustrations which show the disposition of the vascular supply of the ileocecal-appendicular region. This arterial network furnishes the key to the problem brought up by the retrocolic position of the appendix. It shows that easy access to the appendix and perfect hæmorrhage may be secured.

Descomps describes especially the position of the appendicular artery and shows that the appendix can be reached by passing below and outside and turning back the cæcocolic mass and its vascular network toward the median line. The incision is generally between 4 and 6 cm. in length and perpendicular to the umbilico-iliac line at the juncture of its middle and external thirds. The ascending colon is exposed from within outward to gain access to its posterior surface. The peritoneum is incised along the colon to the iliac fossa, and the colon with the terminal ileum and cæcum and the regional vascular network is turned back toward the median line. The appendix is then easily accessible as it is adherent to the posterior surface of the reversed colon and its vessels. Its base having been sectioned between forceps, it is progressively freed, beginning at the apex, and removed. Hæmostasis is effected by stages, the vascular pedicles being tied and cut successively. The bleeding retrocolic surface is covered by turning back the colon to its original position. If necessary, colopexy may be done in addition.

W. A. BRENNAN.

Duval, P., and Grégoire, R.: The Technique of Fixation of the Ascending Colon; Quadrilateral Colopexy (Technique de la fixation du colon droit; colopexie en équerre). *Presse méd.*, Par., 1921, xxix, 233.

Defective attachment of the right colon sometimes causes sufficiently serious trouble to necessitate operation. The authors describe the technique of what they consider the best method of fixation as follows:

The abdomen is opened by a vertical incision a finger's breadth outside the external border of the right rectus muscle, beginning just beneath the border of the rib and running downward 8 to 10 cm. Because of their fan-shaped irradiation, the intercostal nerves which supply the anterolateral muscles of the abdominal wall will be involved little or not at all. The ninth intercostal nerve may be cut as injury of one intercostal nerve does not interfere with the contractility of the muscles of the wall. When the ascending colon has been freed from its anatomical attachments and adhesions, a suture is passed through the anterior longitudinal band at the point where it joins the transverse colon. The colon is then drawn toward the median line so as to expose its posterior surface and the abnormal mesocolon.

The right iliac fossa is now empty and the posterior parietal peritoneum exposed to view. A triangular incision is then made in the posterior peritoneum. The external side of the incision is vertical and the upper side horizontal. The internal side corresponds to the root of the abnormal mesocolon. The ascending colon and its mesocolon lie on a surface denuded of peritoneum with which adhesions may form and to which it is fixed also by sutures. Two, three, or four sutures are passed through the posterior longitudinal band of the colon

and the psoas and quadratus lumborum. When present, the tendon of the psoas minor gives a very solid point of attachment. A number of sutures or a continuous catgut suture is passed through the vertical line of the resection of the posterior parietal peritoneum and the visceral layer of the external edge of the ascending colon. The ascending colon is then firmly fixed so that it cannot descend.

The transverse colon is fastened in a horizontal direction at right angles to the ascending colon. It cannot be sutured on the posterior side, however, because of the presence of the kidney, the vena cava, and the duodenum. Therefore the peritoneum on the posterior surface of the rectus muscle is incised and the posterior surface of the muscle exposed. As the peritoneum is closely adherent to the sheath of the muscle, the latter also is usually incised so that the colon may be attached directly to the muscle itself.

The wall of the abdomen is then pulled forward and two or three sutures are passed with a curved needle from the inner end of the horizontal suture in the peritoneum which runs from the linea alba to the free edge of the laparotomy wound through the anterior longitudinal band of the transverse colon. These sutures are tied and the abdominal wall is closed in the usual way.

As the ascending and transverse colons are now firmly fixed at right angles to each other there is no possibility of further adhesions between them.

A. G. MORGAN, M.D.

Sutton, G. D.: Vesicosigmoidal Fistulæ. *Surg., Gynec. & Obst.*, 1921, xxxii, 318.

In 10 per cent of 1,000 proctoscopic examinations made by Sutton at the Mayo Clinic a terminal sigmoid constriction was found; that is, there was an anatomical obstruction to the passage of the proctoscope. In some cases this may have been due to the influence of a short mesentery of the sigmoid and the shape of the sacrum. Such a constriction is a probable cause of diseases of the rectum such as acquired diverticula, diverticulitis, localized acute infections, and malignancy.

In all, 256 cases of vesicosigmoidal fistulæ have been reported in the literature; 75 per cent of the patients were females and 25 per cent males. From 16 to 33 per cent of enterovesical fistulæ are vesicosigmoidal in type.

Diverticulitis or peridiverticulitis may be a direct or indirect factor in the production of vesicosigmoidal fistula. Others of importance are age, cachexia, obesity, prolonged retention of fæces, flatulence, variation in the size of vessels, muscular deficiency, and congenital predisposition. As pathologic processes resulting from infection through intestinal diverticula McGrath, in 1912, mentioned acute or gangrenous inflammation of diverticula of the sigmoid with perforation and general peritonitis, localized abscess formation, submucous fistulæ, and fistulæ involving surrounding viscera, most frequently the bladder.

Of 59 cases of vesico-enteric fistulæ operated on at the Mayo Clinic between January 1, 1907, and January 1, 1920, 34 were of the vesicosigmoidal type. In this series of cases the etiological infection was in organs adjacent to the bladder, such as the appendix, sigmoid, rectum, and fallopian tubes. Infection of the fallopian tubes was the most frequent cause, being responsible in 36.23 per cent of the cases. Diverticulitis was the cause in 17 per cent. Fistulæ due to a primary carcinoma of the sigmoid are easily distinguished from those due to other causes or to malignancy superimposed on an old diverticulitis with recurrent signs and symptoms.

Cystoscopic examination of 26 of the 34 patients showed a fistulous opening in the posterior wall and dome of the bladder. In the presence of granulations or marked inflammation, the opening may be differentiated from the urethral meatus by the passage of a catheter and by X-ray plates. The inflammatory changes are due largely to: (1) the size of the fistulous opening, (2) the amount and character of the bowel contents and foreign material passed into the bladder, (3) urethral obstruction and residual urine from stricture or hypertrophy of the prostate, and (4) infective organisms.

Care must be taken during the cystoscopic examination not to pass the catheter through the inflammatory tissue into the peritoneal cavity.

Vesicosigmoidal fistulæ may be demonstrated by the cystogram and the use of sodium bromide; methylene blue injected into the rectum will pass into the bladder and vice versa. Proctoscopic examination also may show the condition, though usually with difficulty. Bladder stones may form in the foreign material as a nucleus and add to the discomfort.

The diagnostic features of vesico-enteric fistula are bladder irritability, frequency, and dysuria, the passage of gas, and feces and foreign substances in the urine. The prognosis as to life depends on factors of malignancy, peritonitis, metastatic foci of infection, and embolism. The prognosis as to cure depends on the nature, location, and extent of the infective process and the response to proper medical and surgical treatment.

The etiological factors, cystoscopic findings, and postoperative results in the cases reviewed are tabulated. Twenty-three of the 34 patients were cured by operation, 6 were benefited, and 6 had recurrences. One of those with recurrence was cured by a second operation. There were 4 post-operative deaths.

After free drainage has been established proper radical dissection and removal of all diseased tissue are done. All of the patients with vesicosigmoidal fistulæ of tuberculous origin were cured, although one had a mildly persistent abdominal and vaginal suppurating sinus. The difficulty in the technique of the operation is the establishment of free drainage and the prevention of the formation of pus pockets in the operative field which is always infected.

MERLE R. HOON, M.D.

Bensaude, R., and Cain, A.: The Indications, Technique, and Interpretation of Biopsy in Rectal Tumors (Les indications, la technique et l'interprétation de la biopsie dans les tumeurs du rectum). *J. de chir.*, 1921, xvii, 211.

Rectal biopsy is a useful complement to clinical and rectoscopic methods of exploration; it is often the only means of making an accurate and rapid diagnosis. It is especially indicated in the diagnosis of tumors.

The only contra-indications to rectal biopsy are technical. It is not always possible, and it is sometimes dangerous, to remove a piece of the rectal wall. As this wall is thin, a biopsy should be done only when the tumor protrudes into the rectal lumen; otherwise the superficial planes may be passed, the vascular plane invaded, and ulceration or infection established. Biopsy should be restricted, therefore, to rectal vegetations or to the border of such ulcerations. It is contra-indicated when the area is hyperæmic as severe hæmorrhage may result. Infection of the rectum is also a contra-indication.

The biopsy should be preceded by a rectoscopic examination to select the site. Suppurating necrosed zones should be avoided. No special preparation of the patient is necessary. The biopsy is not painful. The removal is made with the Bruening cutting forceps introduced into the rectoscope and manipulated under full control of the eye.

The authors describe the microscopic characteristics of the principal cancerous and other neoplasms found in the rectum.

The development of radium therapy permits the supposition that a biopsy will be found useful in the intervals of radium treatment to judge of the effect of the radium and the results obtained.

W. A. BRENNAN.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Reid, M. T.: Drainage of the Common Bile Duct through the Cystic Duct: Cysticocholedochostomy. *Ann. Surg.*, 1921, lxxiii, 458.

By the method which the author calls "cysticocholedochostomy" the common duct is drained through the cystic duct in cases in which it has been necessary to incise the common duct for the removal of stones. The advantages of this procedure are summarized as follows:

1. The incision in the common bile duct may be closed completely and allowed to heal by first intention.
2. The abdominal wound and drainage tract are more apt to heal quickly when there is no leakage of the bile which usually is infected.
3. The period of bile drainage may be shortened by weeks. As a rule the tube may be removed as soon as clamping it does not cause abdominal distress or vomiting.
4. In half of the cases there is no leakage of bile following the removal of the tube and in no case is

there any considerable leakage for more than two days.

5. When there is a serious infection of the bile ducts they may be irrigated through the tube with a mild antiseptic solution.

6. This technique may afford a means of relieving the bile pressure in the biliary tract.

In the excision of the gall-bladder the cystic duct is divided about 2 cm. from the common duct. If very small, the cystic stump can then be stretched by a suitable clamp. A drainage tube of proper size—usually a No. 19 French catheter—is passed through the cystic into the common duct before the incision in the latter is closed and is maintained in place by one stitch of No. 00 catgut passed through its side and the wall of the cystic duct. The incision in the common duct is closed by one row, or preferably two rows, of interrupted fine silk (No. 0) sutures. For the inner row the finest catgut may be used. The suture line is covered with fat or other tissue, and three or four slender cigarette drains or very thin Halsted drains made by rolling gauze around gutta percha tissue are placed about the rubber catheter.

Some of the drains are removed on the second or third day after the closure of the abdomen, and the remainder on the third, fourth, or fifth day. The catheter is not removed until the wound in the common duct has healed. It is very important to have the catheter fit snugly into the stump of the cystic duct in order that leakage of bile may be prevented. From time to time the catheter may be clamped off postoperatively to determine whether the bile is able to pass through the common duct easily. This should not be tried before the fifth day; in badly infected cases it should be delayed until later than that in order to give the common duct sufficient time to heal. When no distress ensues the tube may be removed.

The author reports four cases in which this operation was performed. MARCUS HOBART, M.D.

Navarro, A.: Pancreatic Lithiasis (Lithiasis pancreática). *An. Fac. de med. de Univ. de Montevideo*, 1921, v, 627.

Navarro's patient was a woman 32 years of age. Most of the symptoms seemed to indicate that the condition was biliary lithiasis, but complaint was made of a dull transverse pain a little above the umbilicus which extended from right to left, was increased by the ingestion of food, did not show paroxysmal crises, and certainly was not hepatic in type. The patient became rapidly emaciated. When the zone of the pancreas was slightly compressed there was diminution in the number of the pulsations and the amplitude of the pulse.

At operation the gall-bladder was found to be distended and full of calculi. A calculus was extracted from the common duct. Three calculi were extracted from the head of the pancreas. Two of the latter were near the lower edge, and the third, much larger and different in type, was in a distended

canaliculum. The two smaller stones were typical pancreatic calculi. The third had a cortex similar to that of a biliary calculus and the author believes its nucleus was borne into the canaliculum of the pancreas by the reflux of bile.

The calculi were easily extracted from the pancreas, the gall-bladder was extirpated, and the patient made a good recovery.

The author discusses at length the symptoms of pancreatic lithiasis; also the relationship of this condition to pancreatic diabetes and pancreatic tumors.

W. A. BRENNAN.

Mayo, W. J.: The Relation of Chronic Fibrosis and Thrombophlebitis of the Spleen to Conditions of the Blood and of the Liver. *Arch. Surg.*, 1921, ii, 185.

The spleen has few functions that can be determined accurately and it is very evident that other hemolymph organs with which it is associated can readily assume its work. Its relation to disease in general is uncertain since necropsy findings in the spleen are seldom characteristic of the disease which produces death. The spleen in the young shows great cell activity. This decreases with age until its senility is established about middle age. Splenic disorders as a rule become manifest soon after the age of puberty.

The spleen receives more blood than is necessary for its own nutrition and its function is related to the constituents of the blood stream. Its supply of blood comes from the largest branch of the coeliac axis. The spleen and the liver are closely associated and their combined action may well be compared to that of the kidneys; the spleen acts as the malpighian bodies of the kidneys, and the liver, as the tubules; the spleen initiates certain processes which it cannot finish. The blood from the spleen is carried by the portal circulation, with blood from the mesenteric vessels, to the liver where it is acted on by the hepatic cells before it is passed into the general circulation. The spleen is the one organ of the body in which normally the blood comes directly in contact with its constituent cells; these pulp cells are essential to its function. The functions of the spleen concern the filtering of microorganisms and toxic substances from the blood and the destruction of deteriorated red cells.

Splenomegaly occurring in chronic sepsis, typhoid, tuberculosis, malaria, syphilis, and kala-azar is apparently a result of the body's inability to send to the liver for destruction the microorganisms which the spleen has caught and is unable to destroy. Even if the microorganisms eventually die, the changes in the spleen are permanent and the organ may continue unnecessarily to destroy the red blood corpuscles and cause a grave secondary anæmia, a true splenic anæmia. The effect on the spleen of the different organisms and toxic substances which the spleen removes from the blood is the production of a definite basic pathologic picture, namely fibrosis and thrombophlebitis, in addition to the

specific changes due to the peculiar microorganism which is responsible. The chronic anæmia results from the red-cell destruction caused by the splenic fibrosis and thrombophlebitis without regard to the cause of the pathologic condition in the liver, and the terminal portal cirrhosis of the liver might be described as a tertiary lesion resulting from the splenic anæmia.

The liver is the great agent of detoxication in the body. Chronic failure to destroy microorganisms or toxic material, however, may end in portal cirrhosis. Portal cirrhosis of the liver as a terminal stage of splenic anæmia does not differ in any important respect from portal cirrhosis of the liver due to known toxic agents from the alimentary tract such as pepper or alcohol. It may therefore be assumed with reason that unknown toxic products filtered out of the general circulation by the spleen produce the splenomegaly of splenic anæmia, and that the liver, becoming finally unable further to detoxicate the poison carried to it from the spleen, develops cirrhosis. This would explain why removal of the spleen in some cases of splenomegaly of unknown cause results in the betterment of the hepatic function by diverting the unknown toxin from the liver. It seems probable, however, that the true explanation is that the chronic fibrosis and

vascular changes in the spleen produce the agent which acts detrimentally on the liver cells without regard to the causes of the condition in the spleen and splenectomy acts to relieve the liver of a large amount of blood which is normally carried to it by the splenic vein and by so doing reduces the work of the liver which in its cirrhotic condition it is unable to handle.

Experimental findings in the marrow correspond to the blood picture after splenectomy. It seems definitely established that the spleen does not destroy red corpuscles indiscriminately; it acts in this manner only on those which are in some way prepared for destruction outside the spleen.

"With our present knowledge, therefore, satisfactory classifications of the diseases of the spleen which are concerned in the liver cirrhoses and in the anæmias is not possible. . . . Much of what little knowledge I possess of the subject has come from routine examination of the spleen during abdominal operations. . . . The mass of material observed leaves the impression that generalized splenic fibrosis and thrombophlebitis are the result of many causes, and the pathologic changes in the spleen, the liver, and the blood are regularly developed without regard to the primary etiological factors."

W. C. CHANEY, M. D.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bauer, K. H.: *The Identity of So-Called Idiopathic Osteopsathyrosis and Osteogenesis Imperfecta; Constitutional Pathology of Surgical Diseases* (Ueber Identität und Wesen der sogenannten Osteopsathyrosis idiopathica und Osteogenesis imperfecta; zugleich ein Beitrag zur Konstitutionspathologie chirurgischer Krankheiten). *Deutsche Ztschr. f. Chir.*, 1920, clx, 289.

The author reports the case of a boy of 11 who had had twenty-two clinical bone fractures between the ages of 1½ and 4 years, and in all had had at least fifty fractures. The fractures occurred on the slightest provocation, such as turning around or sitting up in bed, and always healed quickly. As a result there was marked deformity of the thigh and upper arm, while the leg and forearm were very long and slender and the child was unable to walk. The skin was tender and the sclera were bluish. Marked hyperplasia of the lymphatic pharyngeal ring was noted. There was a relative lymphocytosis of 41 per cent.

The roentgen examination showed increased transparency of the bones. This was due, not to lack of calcium, but to loose structure of the bones and decreased size of the trabeculae. The bone cortex was very thin, and in some places the normal architecture of the bone had totally disappeared.

Histological examination showed a crumbling reticular ground substance with no true cortex.

This peculiar picture has been variously interpreted. It is attributed by Lobstein to an increase of the marrow cavity at the expense of the compact tissue, while Gurlt believes it is the result of bone atrophy extending outward from the center. In Schuchhardt's opinion it is a dysplasia of the periosteum. According to Anschuetz, it is due to an intense absorption on the periosteal side of the bone. Looser identified the disease in 1905 with osteogenesis imperfecta. A typical case of osteogenesis imperfecta examined by the author in the Aschoff Institute was that of a seven months foetus with extremely short and deformed limbs and a great deal of hair. The roentgen picture showed over one hundred fractures, normal epiphyseal lines, no clearly defined bone structure, and no compact bone tissue. Autopsy showed a congenital goiter, numerous lymph nodes in the mesentery and pharynx, and large tonsils. Histological examination showed lymph follicles of the spleen and eosinophilia of the lymph nodes of the thymus, the spleen, and the hypophysis. In the small arteries there was marked hyperplasia of the internal coat, and in the vessels of the thyroid arteriosclerosis was found. The bones showed no lamellar structure, no system of trabeculae, and no cortex.

It is generally believed that in osteogenesis imperfecta the osteoblasts are the tissue element primarily injured, but Kaufmann's pupils, Sumida and Dieterle, consider it the result of a congenital malformation of the periosteum and endosteum.

Looser was the first to claim that these two diseases are identical because they both show the same defective cartilaginous and periosteal bone formation, due to imperfect function of the osteoblasts, and in both the epiphyseal cartilages, the preliminary calcification of cartilage, and the absorption of bone are normal. Moreover, both diseases show the same abundance of cells and large bodies of bone which in places are confluent, and the same rapid healing of the fractures. The chief difference is in the time of their appearance which makes it necessary to distinguish between congenital and late osteogenesis imperfecta. Schmidt, Schmorl, Lovett, Sumida, and numerous others agree in general with Looser's theory but Axhausen, von Recklinghausen, and Wieland disagree with it.

The author agrees with Looser as he has found that persons with osteogenesis imperfecta survive; that there may be a pronounced tendency to fracture of bones reaching back to childhood; and that osteogenesis imperfecta and osteopsathyrosis idiopathica may appear in the same family in the same generation. The identity of the two diseases is indicated also by the similarity in the clinical course and the histologic pictures. The author compares his microscopic findings in osteogenesis imperfecta with those of Doering and Hart in cases of osteopsathyrosis. The roentgen pictures also indicate that the two diseases are the same, one showing incomplete formation of bone before birth and the other the same condition after birth.

However, the similarity of the two diseases is not limited to the bone changes. In the examination of his case of osteogenesis imperfecta the author found that the part of the tooth anlage developing from the ectoderm was normal, while the structures developing from the mesoderm — the pulp and its derivatives — showed marked changes. The odontoblasts were irregularly scattered and the dentine showed a crumbling structure. There were pronounced abnormalities also in other supporting structures of the foetus. The cartilage cells, not in the zone of ossification but in the midst of the epiphysis, showed spindle and spear forms, while the fibroblasts of the perichondrium and periosteum showed wavy, curly, and short fibers. These facts indicate that this disease is more severe the higher the involved tissues stand in the scale of individual and phylogenetic development.

Phenomena analogous to these changes are found also in the disease heretofore known as osteopsathyrosis. An example of this is the extreme fragility of the bones coexisting with blueness of the sclera which is due to a lack of connective tissue in the sclera allowing the choroid pigment to show through. This has been described by Eddoves, Carboni, Salvetti, Bolten, and Mass and was noted in the case described by the author. It tends to confirm the theory that congenital and late osteogenesis imperfecta constitute a systemic disease of all the supporting tissues of the body. The author goes farther and includes the lymphatic tissue as a

derivative of the mesoderm and related to the supporting tissue. From the tendency of his case of late osteogenesis imperfecta to frequent inflammations of the nasopharynx and anginas, as well as from the demonstration of a relative lymphocytosis, he concludes that in this condition there is a congenital defective development of lymphatic tissue.

The arteriosclerosis and the eosinophilia in the 7 months' foetus indicate an anomaly in the development of the blood vessels and blood which are derived from the mesoderm. However, when we consider that there are a number of structures which are derived from the mesoderm — for instance the muscles, which are normal in osteogenesis imperfecta — this disease cannot be an anomaly of all the mesodermal tissues, but involves rather the tissues derived from the mesenchyme. The author does not agree with those who consider that this is due to an injury of the mesenchyme at a very early period of foetal development, nor with those who ascribe it to a disturbance of internal secretion. In his opinion it is the result of a primary defective formation of the whole mesenchyme, an inherited constitutional anomaly. This view is supported by the hereditary and familiar appearance of the disease, the fact that it is frequently observed in association with other constitutional diseases such as progressive muscular dystrophy and hæmophilia, the findings in the lymphatic and vascular system, and the eosinophilia. The peculiar constitution of these patients is shown also by certain bodily characteristics; in the congenital form there is abundant development of hair, unusual development of the subcutaneous fat, and tenderness of the skin; in late cases the patient has a tired expression of the face, wide-awake eyes, an oval face, a pale skin, and little subcutaneous fat. Persons affected with these conditions are similar in temperament. They are all intelligent, pleasant, sexually normal, capricious, and mentally developed beyond their age.

In conclusion Bauer states that congenital and late osteogenesis imperfecta is an inherited constitutional anomaly of all the derivatives of the mesenchyme affecting the bodily characteristics, the constitution, and the temperament. He believes that other constitutional anomalies may have a basis similar to that of osteogenesis imperfecta and that when these anomalies are traced to a defective formation of one or the other germinal layer, a new principle of classification will be established for all constitutional defects due to defects of the germ plasm.

KEMPF (Z).

Fromme, A.: The So-Called Osteochondritis Coxæ and Its Identity with Arthritis Deformans Coxæ (Ueber die sogenannte Osteochondritis coxæ und ihre Identität mit der Arthritis deformans coxæ). *Zentralbl. f. Chir.*, 1921, xlviii, 154.

Osteochondritis is nothing more or less than a disturbance in the normal course of ossification of the epiphyses. There are several etiological factors. Disturbances of the circulation and inflammation

are rarely responsible. Trauma is much more frequently the cause, especially when it is preceded by certain disturbances in the normal course of ossification under the joint cartilage, such as rickets and late rickets, both of which are common. The author believes these are the most frequent causes of osteochondritis. In his opinion also osteochondritis and arthritis are the same thing, their symptoms being different only because one affects a growing joint and the other a fully-grown joint.

ADLER (Z).

Ollerenshaw, R.: The Development of Cysts in Connection with the External Semilunar Cartilage of the Knee Joint. *Brit. J. Surg.*, 1921, viii, 409.

Cystic changes in the external semilunar cartilage have been recorded by several German observers. The author mentions one specimen in the museum of the Royal College of Surgeons and describes three cases which he saw at the Salford Royal Hospital.

All the patients were adult males who gave histories of trauma to the knee joint. The injury was followed by gradually increasing pain and lameness with swelling over the external cartilage. The swelling was rounded and varied in size from $\frac{1}{2}$ to 1 in. in diameter. It was tense but distinctly fluctuant.

In the first case the cyst had been removed eighteen months previously and had recurred. Recurrence followed removal in several of the reported cases when simple excision was done. Removal of the entire external cartilage gave complete relief from symptoms.

Macroscopically the cysts were multilocular and appeared to develop in the substance of the fibrocartilage near its outer border. The cysts contained a clear mucoid material and the lining was smooth and shiny. Microscopic examination showed a distinct lining of flattened endothelial cells. Other observers have not found this endothelial lining and have concluded that the condition was degenerative. The author's view, however, is that the cysts are developmental in origin and due to small endothelial inclusions. In all of the cases they were present in the external cartilage.

J. I. MITCHELL, M.D.

Jansen, M.: Hallux Valgus, Rigidus, and Malleus. *J. Orthop. Surg.*, 1921, n. s. iii, 87.

Hallux valgus, hallux rigidus, and hallux malleus, each of which may occur by itself or in association with the others, are due to a disturbance of muscle balance and arthritis deformans. Hallux rigidus develops in persons with slightly pronated feet and is due to the extra strain on the great toe joint. Lipping of the joint cartilage causes pain in walking. The flexor brevis hallucis contracts to relieve the symptoms and finally a condition of permanent involuntary contracture results in hallux malleus.

In hallux valgus an important factor is the luxation of the extensor proprius and flexor longus

hallucis, the pull of which muscles causes spreading of the metatarsal heads.

Treatment should include restoration of muscle balance. Transplantation of the abductor hallucis has proved beneficial. It may be necessary in some cases to shorten the first metatarsal.

W. A. CLARK, M. D.

FRACTURES AND DISLOCATIONS

Smith, S. A.: The Treatment of Fractures. *Brit. M. J.*, 1921, i, 483.

The diversity of opinion with regard to the treatment of fractures led to the appointment of a committee by the British Medical Association to report on the merits and demerits of operative and non-operative methods. The committee favored the operative method. During the war, Pearson, Sinclair, and others obtained very excellent results from conservative treatment by standardized methods. The author acknowledges a prejudice in favor of conservative treatment.

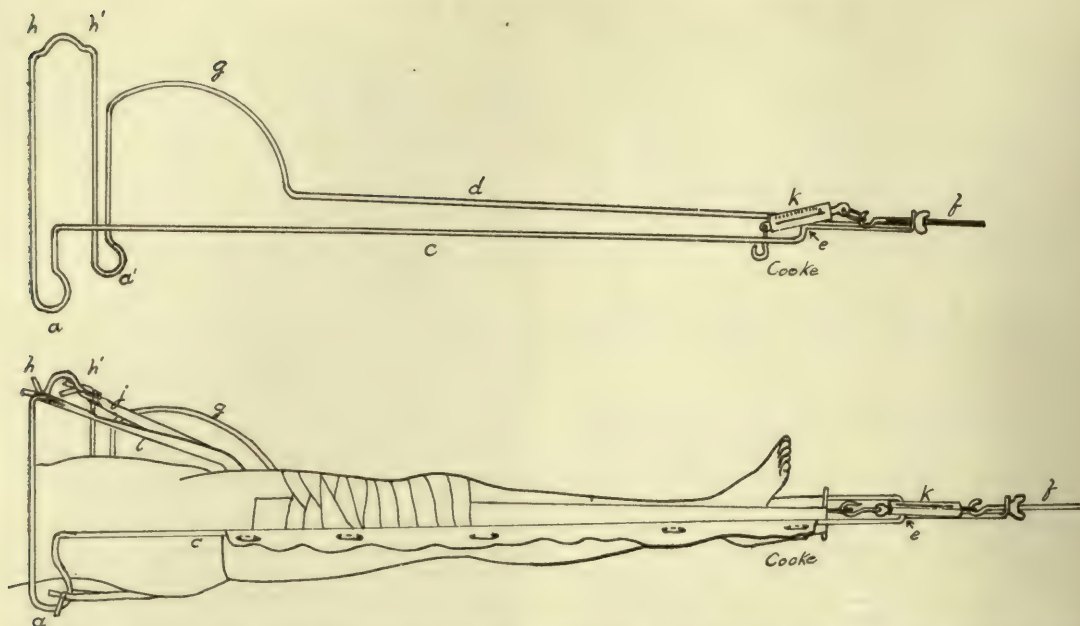
Malunion and non-union are common occurrences and are often related. Even if end-to-end apposition cannot be secured in the lower limit, correct alignment should be obtained by strong, steady fixed traction and splinting.

The common types of malunion are coxa vara at the hip, outward bowing in fractures of the upper third of the femur, and concavity forward with genu recurvatum in fractures of the middle and lower parts of the shaft. In the tibia, bow-leg may result, and at the ankle, valgoid deformity of the foot. A fracture is a potential deformity and must be regarded as such. In accordance with Wolf's law, alterations in the internal architecture of the bones occur in response to new forces of strain and muscle stress, with pain and discomfort and traumatic arthritis in the neighboring joints.

The most common causes of malunion are insufficient traction and inefficient splinting which do not control the joint above and below the fracture or disregard the normal contour of the bone. Thus, if a fracture of both the tibia and the fibula is set absolutely straight it will cause an everted ankle and a strained internal lateral ligament of the knee when the patient begins to walk. A third cause of malunion is too early weight-bearing.

The chief causes of non-union are loss of bone substance and too frequent examination and manipulation. Pain on pressure is a valuable sign in suspected cases of non-union. Sluggish bony union may be hastened by passive congestion and mild irritation. Stimulation by use should always be tried in the lower limb before operating. Of the operative procedures, bone grafting is the method of choice.

The author advises immediate operation on spiral fracture of the lower third of the tibia, fractures of the patella, and fractures of the scaphoid when the proximal fragment prevents full hyperextension of the wrist. Fractures of the neck of the femur are treated in abduction on the Thomas frame



Splint for Treating Fractures of Long Bones—Cooke. (Illustration by courtesy of *Journal of the American Medical Association*.)

or in plaster by the Whitman method. Fractures of the shaft of the femur or of the upper part of the tibia are treated in a Thomas splint. Traction by ice tongs or Steinmann's pins is usually not necessary. The reduction of a Pott's fracture is more important than the splint. Traction on the foot in extreme extension, a downward pull on the leg, and an upward pull on the heel are usually sufficient. The tendo achillis may be divided. The foot is put up in inversion at a right angle to the leg.

In the arm, fractures of the anatomical neck of the humerus are best treated by a wrist sling which allows the weight of the arm to act as an extension. If the upper fragment is abducted, as in epiphyseal separations, the arm must be abducted. If it is impacted in faulty alignment, the method of Thomas for reducing the impaction is excellent. The Jones position of full flexion is used for elbow fractures. Fractures of the shaft of the radius and ulna are treated in supination. Colles fractures are reduced preferably by the Jones method and placed on well-padded, twisted metal splints for four weeks.

J. I. MITCHELL, M.D.

Cooke, G. C.: A New Splint for Treating Fractures of the Long Bones. *J. Am. M. Ass.*, 1921, lxxvi, 1162.

The splint proper is made of a $\frac{7}{8}$ in. iron rod with a loop at the upper extremity which arches over the patient's body and rests on the mattress at *a* and *a'* on each side. These points are continuous with two parallel rods, *c* and *d*, which are 7 in. apart, 4 ft.

long, and 5 in. higher than points *a* and *a'* and jointed at *e*, where a flat bar 6 in. long is welded on and bent at right angles. In the upright end of this flat bar is a $\frac{3}{8}$ in. hole through which passes a bolt 5 in. long with a hook on one end and a thumb nut on the other. At *g*, a loop is made in one of the parallel rods according to whether it is to be applied to the right or the left leg. This is to allow space for the unaffected leg. At *h* and *h'* are notches in the loop for the attachment of two straps. These straps, which may be padded with cotton or a pneumatic cushion, pass over the groins, between the legs, and in the gluteal fold to *a* and *a'*, where they are secured; they furnish a rigid but comfortable countertraction.

In one end of the bolt a spring balance is hooked to give a resilient pull on the adhesive spreader (that which is used on any form of Buck's extension) and to indicate the amount of pull in pounds.

With this splint applied, the patient can sit up in bed and move himself about without disturbing the traction, and when the pressure on the perineum becomes distressing he can rest the perineum without disturbing the traction of the splint by making pressure on the splint at *h* and *h'*. When a cloth is properly placed on the splint and secured with safety pins as used on the Thomas splint and shown in the drawing, the splint described has a material advantage over the Balkan frame or other forms of Buck's extension appliances in that the patient may be examined with the X-ray at any time.

I. W. BACH, M.D.

Henderson, M. S.: The Treatment of Ununited Fractures. *Ann. Surg.*, 1921, lxxiii, 487.

Ununited fractures may be divided into two groups: delayed union and non-union. The latter can be made to unite only by operative measures. The bone graft offers the best chance for cure. Three types of bone grafting are discussed. The intramedullary graft is the least favorable. The inlay graft is almost perfect mechanically, but often fails, especially when the bones show osteoporosis. The massive graft described by the author gave a higher percentage of good results than any other method in a series of 34 cases of non-union of the humerus.

Recent investigation has shown that the cancellous bone of the endosteal tissue is rich in osteoblasts. A few of these bone-forming cells are found in the cambrium layer of the periosteum, more in the haversian canals, and the greatest number in the cancellous tissue. Therefore, to secure the largest possible contact between the osteoblasts of the fragments and the graft, it is necessary to place the cancellous portions in apposition. In applying the massive graft the periosteum and the hard cortical layer of the fragment are chiseled off to expose a large area of cancellous tissue. Against this is placed the cancellous or endosteal side of the graft containing all the layers of bone. The graft is clamped or held in place by the aid of beef-bone screws.

Postoperative fixation is second in importance only to the use of the bone graft. A plaster of Paris cast is the most convenient and satisfactory dressing.

Under certain conditions the use of a bone graft may not be the method of choice. Thus, in the femur, when there is abundant callus and bleeding is hard to control, Lane plates or plates of beef bone may be preferred as they are more easily applied.

Infection of recent date is a contra-indication to operation, and osteoporosis often leads to failure.

Five cases of non-union chosen from a large series, in which a bone graft was used with good results, are reported: two of the tibia, one of the neck of the femur, one of the ulna, and one of the humerus.

J. I. MITCHELL, M.D.

Masland, H. C.: An Integral Traction-Providing Splint for Vicious Fractures of the Femur. *Ann. Surg.*, 1921, lxxiii, 495.

The author devised a splint which is simple in construction but adjustable in every detail, and fulfills the following requirements: (1) immobilization above and below the fracture; (2) broader distribution of the strain of traction, not only to the ischium but also to the pubis, ilium, and body; (3) traction in any degree of abduction, adjustable at will; (4) lateral traction; and (5) comfort. When this device is applied it is possible to move, bathe, or examine the patient without disturbing the relation of the fragments.

The splint reaches from the axilla to beyond the foot. Its length is adjustable as it is made up of over-

riding pieces joined together through slots by machine screws. The pelvic ring also is adjustable. Going over the thigh from the inner to the outer standard is a bridge to which the lateral traction band is attached.

In making the extension apparatus the author uses plaster of Paris from the knee to the ankle. Traction is applied by means of a turn buckle on either side of the leg.

R. V. FUNSTEN, M.D.

Rutherford, H.: Downward Dislocation of the Patella. *Brit. J. Surg.*, 1921, viii, 524.

The author reports three cases of downward dislocation of the patella. One was that of a man 42 years of age, one that of a boy of 18, and the third that of a child of 7. The exciting cause in each instance was a fall or a blow with the knee in the flexed position. The further flexion carried the smaller the surface in contact with the condyles; if the blow is directed downward as well as backward, it is easy for the upper edge of the patella to slip under the condyles or, as in the case of the child, to squeeze through them.

In one case there was a tearing off of the upper edge of the patella with a part of the anterior surface by the quadriceps tendon. In the other cases the tendon was intact. In each instance the articular surface looked upward and the upper end of the bone was wedged between the femur and the tibia. Reduction was accomplished in the adults by open dissection through a skin flap, and in the child by means of an elevator inserted through a cut to the side of the patella. The results were good.

When the quadriceps tendon is not torn across there may be a partial tearing out of the patella from the deep surface of that tendon.

J. I. MITCHELL, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Coughlin, W. T.: Transplantation of Cartilage. *South. M. J.*, 1921, xiv, 311.

In the past eight years, and especially in the last four, much attention has been given to the transplantation of cartilage. The procedure came first prominently into notice at Ceci's Clinic in Pisa, Italy, during the Turco-Italian war.

In war wounds of the face, in which loss of the underlying hard parts rendered the deformity more pronounced, resort was had to cartilage implantation to overcome the skeletal defects.

Cartilage adapts itself most readily to transplantation and is easy to obtain. The supply furnished by the individual himself is practically unlimited. The removal of the graft does not impair function nor cause disfigurement or deformity. Cartilage is easily worked into the desired form, no elaborate mechanical device is necessary for its removal or embedding, it appears to live and retain its shape and size, and it is not so susceptible to the action of pyogenic organisms as other grafts, often healing in

firmly even after long suppuration of the wound.

Heteroplastic grafts do not long survive, but are absorbed, their place being taken by scar tissue.

As the result of a series of experiments, Davis concluded that even when it is without perichondrium the graft remains unabsorbed.

Bone, when transplanted, must be placed in contact with living bone and be made to functionate or it will become absorbed or atrophied. Cartilage embedded anywhere in the tissues retains its form and strength apparently indefinitely unless subjected to greater stress of weight than that which it formerly carried.

For transplantation into the skull, costal cartilage is taken, split in the coronal plane, and applied to the defect so as to conform to the skull contour. The periosteum is loosened from the skull, the beveled cartilage is inserted, and the periosteum then stitched to it. The perichondrium is not removed from the graft. Perfect hæmostasis is desirable. Sepsis is not to be feared as in bone grafts, as cartilage is much more viable. Union is fibrous and the graft seldom slips or becomes broken.

L. C. DONNELLY, M.D.

Rehn, E.: Transplantation and Regeneration of Tendons (Zum Regenerations- und Transplantationsproblem; Sehnen und sehnenverwandte Gewebe). *Jahresb. f. aerztl. Fortbild.*, 1920, xi, 37.

This is a discussion of experimental work to clear up the question of the causes of tendon formation after tenotomy. Bier believes that hormones are responsible, but in the author's opinion ordinary connective tissue is changed into the preliminary stages of tendon and fascia by the rhythmic pull of the muscles. Immediately after the operation, therefore, he places the tenotomized muscle in continuous mechanical activity designed to produce external work. He discusses the practical use of these experimental results in free transplantation in man, especially connective-tissue transplantation.

KALB (Z).

Haertel, F.: The Origin and Treatment of Suppurations of the Fingers and Hand (Entstehung und Behandlung der Eiterungen an Fingern und Hand). *Ztschr. f. aerztl. Fortbild.*, 1921, xviii, 29.

After a short discussion of the affections which must be taken into consideration in the differential diagnosis of suppurations of the fingers and hand, Haertel takes up the various forms of suppuration, dividing them into superficial and deep, and describes his own methods of treatment.

In the superficial suppurations of the nail, paronychia and panaris of the nail, prophylaxis is of great importance. The treatment consists in rational care of the nail. If infection occurs, the nail should not be removed immediately as frequently it may be saved by energetic conservative treatment. The latter consists in applying unguentum cinereum to the base of the nail and winding adhesive plaster strips around it.

If the suppuration is beneath the nail, the nail may be trephined to drain the pus. Cutaneous panaris often indicates a deeper abscess. In such cases the skin must be incised at once at the point of greatest tenderness on pressure, and the necrotic focus freely exposed. According to Klapp, the focus should be radically excised. Tampons should not be used in the after-treatment. Damp compresses, especially compresses wet with alcohol, and too frequent bathing are also contra-indicated as they cause the skin to swell. Cases have been known in which gangrene was observed after alcohol dressings. A salve dressing is rational.

The deep suppurations arise either directly or from subcutaneous panaris. The prognosis is always grave, but depends to a great extent on early diagnosis. In the diagnosis of panaris of the tendon sheaths loss of motility in the middle and end joints is of great importance. The chief danger is necrosis of the tendons, which occurs very readily if the blood supply is interfered with. In the treatment Haertel makes Klapp's short, lateral incision at the top of the joint. Tamponing is contra-indicated in the after-treatment. Daily irrigation has a good effect. Bier's hyperæmia combined with movement tends to preserve function. If necrosis develops in the tendons an attempt should be made to cause sequestration with hyperæmia and hot air treatment before incising.

Hyperæmia also has an excellent effect in beginning panaris of the bones and joints. If operation must be performed, a simple lateral incision of the ball of the finger is to be preferred to removal of the nail. In phlegmons of the palm or of the tendons of the palm, suitable incisions are necessary, and should be supplemented with hyperæmia.

The deep forms of finger and hand suppuration should be referred to the surgeon. Haertel discusses also the prophylaxis of infection of the hand and the treatment of infected wounds according to modern principles.

E. KOENIG (Z).

Mueller, W.: Methods of Replacing the Thumb (Anatomische Studien zur Frage des Daumenersatzes). *Beitr. z. klin. Chir.*, 1920, cxx, 595.

The loss of the thumb is more serious than that of any other finger because in such injuries the grasping power of the hand is almost entirely lost and this loss cannot be compensated for by practice. Many attempts have been made to provide a satisfactory substitute for the thumb. Nikoladini's method consisted in suturing a roll of soft tissue to the stump and then implanting within it a piece of bone. In a later method the great toe or the second toe was used to replace the thumb. This was better but not satisfactory chiefly because the joints of the toe after implantation lost almost all mobility. Moreover it was often impossible to secure a sufficiently long fixation between the toe and the stump of the thumb, and the grafting was not without danger. In another method the thumb was replaced by a finger of the same hand. To bring the finger to be

transplanted to the stump of the thumb strong compression of the hand was necessary. That this method is justified is shown by the experience of the author, who lost his right index finger but by practice was able in a few weeks to continue his work as a surgeon.

Mueller devised a method of finger interchange on the cadaver which he has not yet tested on living patients. The fourth finger, which is the most easily dispensed with, is used to replace the thumb, and contrary to what was done in the earlier methods, the finger is reversed in direction when it is attached to the stump of the thumb.

A fish-mouth incision is made in the ball of the fourth finger, the nail and the nail-bed are excised, and the tendon of the flexor profundus is freed. The end phalanx is sharpened to a point, turned toward the stump of the thumb, and driven into the first metacarpal. The free end of the flexor profundus of the finger is sutured to the end of the flexor pollicis, and the skin wound of the finger is sutured to the thumb wound.

After the finger and thumb have completely healed together the finger is exarticulated at the metacarpophalangeal joint. The first phalanx, which has now become the end phalanx, is sharpened to a point and shortened, and the flexor tendon fastened to its head. The skin is tunneled and the extensor tendon brought around to the extensor side, pulled through the tunnel, and sutured to the free end of the extensor pollicis. The ball of the new thumb is formed by bringing the soft parts of the flexor side around and uniting them with those of the extensor side.

The advantages of this method are as follows: (1) healing can take place in the most convenient way, (2) the nutrition of the finger is always assured, (3) there is firm union between the finger and the first metacarpal, (4) the newly formed thumb has two intact joints and functioning tendons, and (5) the growth of the finger is assured because the epiphyses are not injured. GANGL (Z).

Nuzzi, O.: Separation of the Second and Third Metacarpals to Provide a Grasping Hand (Intermetacarpolisi distale chirurgica). *Riforma med.*, 1921, xxxvii, 248.

A boy of 18 had been injured by an exploding bomb. The thumb, the thenar eminence, and the tips of the second, third, and fifth fingers of his left hand were destroyed. The finger joints were ankylosed so that no movement of the fingers was possible. The wrist joint was normal. He was unable to hold or grasp anything and the hand was therefore useless. As the fingers were flexed to varying degrees and ankylosed it was impossible simply to construct a new thumb.

The author separated the distal ends of the second and third metacarpals so that the second and third fingers could be separated and objects grasped and held between them. He made a longitudinal incision along the interosseous space

between the two fingers and separated the two metacarpals down to the ligament of the interosseous muscle between the second and third fingers. The transverse ligament of the metacarpals was cut. The tendon of the second dorsal interosseous muscle was dissected free from its insertion on the second metacarpal and attached to the oblique fascia of the adductor pollicis. The fingers were kept apart with bandages.

After a month of passive and active movement there was a considerable free space between the fingers and the patient was able to pick up and hold light objects. A. G. MORGAN, M.D.

Borchgrevink, O.: A New Method of Amputating Below the Knee Joint (Neue Prinzipien fuer die Amputation am Unterschenkel). *Acta chirurg. Scand.*, 1920, liii, 128.

The author recommends that in all amputations below the knee the fibula be entirely removed. This gives a better supporting surface for the artificial limb as it leaves the lateral condyle free and the weight can be equally distributed with median, lateral, and anterior supporting surfaces in the lateral and median condyles and the tuberosity of the tibia.

In the usual operation the lower surface of the external condyle is covered by the head of the fibula and therefore cannot bear any weight. The greater part of the weight is thrown on the fibula which is not fitted to bear it. The fibula is covered only by skin and fascia, and as its neck is crossed by the peroneal nerve, weight-bearing causes neuralgic pain, periostitis of the neck and head, and excoriations of the skin.

If the fibula had to bear all the weight these symptoms would be so severe that they would be intolerable. Therefore the maker of artificial limbs carries the framework of the limb up to the thigh so that the femur or the tuberosity of the ischium bears the weight. If the fibula is removed the weight can be distributed so that the tibia can bear it all, the framework of the artificial limb is not carried above the knee, and the knee joint is left free. A much greater weight can be borne in this way and the gait is freer and firmer.

The author has used this method in 18 cases, 9 of primary amputation and 9 of re-amputation. The functional results were excellent, particularly in the cases of re-amputation. The histories of these cases are given briefly. Emphasis is placed upon the necessity for care in disarticulating the tibiofibular joint in order that injury or infection of the knee joint may be avoided. Borchgrevink admits that an entirely satisfactory artificial limb for the new form of stump formed by this operation has not yet been devised. A. G. MORGAN, M.D.

Steindler, A.: The Treatment of Pes Cavus (Hollow Claw-Foot). *Arch. Surg.*, 1921, ii, 325.

The author describes his complete operative correction of slight and medium degrees of hollow claw-

foot. The extreme degrees of this deformity require more radical measures. For all except the extreme degrees his methods are the following:

1. Stripping of the os calcis, which is done through an incision on the median border of the sole of the foot and consists of the stripping of the plantar fascia and sole muscles from the anterior surface of the os calcis.

2. Osteotomy of the foot, which is done preferably through an outer curved incision and through the neck of the astragalus. Correction of hollow claw-foot is necessary in order to obtain permanent results.

Stripping alone is sufficient only in the milder cases; in the others it must be followed by osteotomy of the foot.

Steindler has operated on 90 patients. Stripping alone has been carried out in 50 cases, stripping and osteotomy in 31 cases. The article gives photographs of 11 cases taken before and after operation. The operative results are shown also in four X-ray pictures.

Olivecrona, H.: The Operative Treatment of Hallux Valgus (Ueber die operative Behandlung des Hallux valgus). *Acta chirurg. Scand.*, 1921, liii, 354.

There are many different operations for hallux valgus, some of which give very good results, but no one operation is wholly satisfactory. The procedures may be classified in three groups, the first consisting of various methods of removing the head of the first metatarsal, the second of wedge-shaped or linear osteotomies, and the third of operations on the tendons which may be combined with methods of the first and second groups.

The author operated on 79 patients from 1912 to 1918. Forty-two of them were examined after several years, and as in some cases the operation was bilateral, the late results were determined in 70 feet. Twenty-nine were operated on by the Schede method, 34 by the Mayo method, 5 by the Hueter method, and 3 by Reverdin's method. Detailed case histories are given. Schede's method is the least extensive of all the methods of resection. It consists merely in chiseling the deformity off and extirpating the bursa and an elliptical piece of skin over it. If the extensor hallucis longus is greatly contracted it is cut subcutaneously. Hueter resects the head of the first metatarsal bone. Mayo resects the head and makes a flap from the bursa, which he interposes in the joint to preserve its motility. Reverdin's method consists of a wedge-shaped osteotomy.

Of the patients operated on by Schede's method 18 (62 per cent) were completely relieved, 6 (20 per cent) were greatly improved, and 5 (18 per cent) were not benefited at all or benefited only slightly. Of the 6 who were greatly improved one had a good functional result for seven years but after that a recurrence. Another complained chiefly of the lack of cosmetic effect. The remaining 5 (18 per cent) were unimproved or only slightly improved.

Of the 34 cases operated upon by Mayo's method, 30 (88.4 per cent) were entirely relieved of symptoms. In one case there was almost complete ankylosis of the metatarsophalangeal joint after the operation but as it caused the patient no inconvenience the case is counted among those that were cured. In another case regarded as cured there were signs of flat-foot on one side, but they had been present before the operation and had not grown worse. The functional result was very good in every instance and there was no case of recurrence of the valgus position. One case was examined eight years, and one seven years, after the operation. The average time after operation was three and one-half years. In one series of cases the resected surface was carefully smoothed off, and in another the head was simply chiseled off without any smoothing of the surface. Motility of the joint was preserved in 55 per cent of the former series and in 35 per cent of the latter. In one case of the latter series there was painful limitation of the movement of the metatarsophalangeal joint. In the former series motility was regained more quickly. There was recurrence in only 1 of the cases operated on by this method. In 3 of the cases the anterior arch of the foot gave way to a slight degree.

The results of Mayo's operation were very good, i.e., complete recoveries in 88 per cent and only slight symptoms in the rest. None of these patients was obliged to return for further hospital treatment.

Only 3 feet were operated on by Reverdin's method. In all of these it was followed by recurrence. In 1 case a second operation was necessary.

Four cases were operated upon by Hueter's method. In none was a complete cure obtained. In 2 there was limitation of movement of the first metatarsophalangeal joint. One patient had almost complete ankylosis of the joint. Two had weakening of the arch; in 1 case this was accompanied by considerable pain. There was no recurrence of the valgus in any of the cases.

The author concludes that Schede's operation offers the best chances of eliminating pain, but often does not correct the deformity. His cases were under observation for an average period of three years. During this time there was no recurrence of pain, but the fact that it did recur in 1 case after seven years shows that a long period of observation is necessary. The operation is not technically difficult and the patient is able to use the foot sooner afterward than after the other operations, being able to walk at the end of three weeks or, at the most, at the end of six weeks after the operation. Schede's operation is not adapted to cases in which the valgus is over 30 to 45 degrees as in these the danger of recurrence is too great.

The functional results were better after Mayo's operation than after Schede's. There was recurrence of the valgus in only 1 case. The time required for recovery was longer, but this could probably be overcome, to some extent at least, by careful

technique. The time was not so long in the cases in which the resected surface was carefully smoothed off after the operation. The greatest danger in the Mayo operation is weakening of the anterior arch of the foot. This occurred in 5 of 38 cases (13 per cent). Three of the 5 were operated on by Mayo's method and 2 by Hueter's method. The extent of the resection seems to be a factor in causing weakness of the arch. On the other hand, the less extensive the resection, the greater the danger of recurrence of the deformity. This is less serious, however, than the danger of injuring the function of the arch. When it is not advisable to resect sufficiently to overcome the deformity completely, it is advisable to apply extension to the great toe for eight to ten days after the operation to stretch the extensor longus hallucis and the soft parts and overcome the deformity gradually. Hueter's operation offers about the same danger of weakening the anterior arch as Mayo's, and does not offer as good chances of preserving the motility of the joint. Reverdin's operation is not recommended by the author.

The article is supplemented by a bibliography and roentgen pictures of cases. A. G. MORGAN, M.D.

ORTHOPEDICS IN GENERAL

Rugh, J. T.: Three Frequent Causes of Weak and of Flat Feet. *Ann. Surg.*, 1921, lxxiii, 499.

The author calls attention to the fact that many cases of flat or weak feet are due to some mechanical defect of an anatomical character.

The first defect mentioned is a shortened tendo achillis. Examination of 50,000 soldiers showed that 12 per cent had heel tendons which would not permit dorsiflexion of the foot beyond a right angle. The ill effects are attributed to the downward and backward slope of the os calcis and the attachment of the tendon to the middle and lower portion of the posterior end. When the tendo achillis is short, walking throws tension on the low arch on the

outer side of the foot. The heel is then lifted from the ground as the body swings forward or remains on the ground, the foot being rotated outward. This outward rotation throws still greater strain on the inner side of the foot. When the strain is relieved, function becomes painless and normal. The tendon may be lengthened subcutaneously by partial resection at different levels. After the age of 35 the author prefers mechanical treatment. The simplest and best mechanical method is the elevation the heel of the shoe or the insertion of a pad inside of the shoe under the foot heel.

The next condition predisposing to weak or flat foot is hypertrophy of the inner end of the scaphoid. The inner border projects inward beyond the line from the border of the head of the astragalus to the internal cuneiform and curls backward along the inner side of the astragalus. In the well-balanced foot the inner portion of the head of the astragalus and the border of the scaphoid and internal cuneiform are in a nearly straight line. If the scaphoid is prolonged inward, it forms an obstruction to adduction of the fore part of the foot.

A third factor discussed is a supernumerary tarsal bone at the inner side of the scaphoid, over which runs the tendon of the tibialis posticus. This bone is called the tibiale externum. It may be entirely separated from the scaphoid or may articulate with its inner end. It is sometimes called the sesamoid bone of the tibialis posticus tendon. The best treatment consists in removing the supernumerary bone and the inner end of the scaphoid, and re-attaching the tibialis posticus further forward on the scaphoid or even to the internal cuneiform. After the removal, the foot should be adducted and held in plaster of Paris from ten to twelve weeks. The patient should then begin to walk on a shoe tilted $\frac{1}{4}$ in. on the inner border of the heel and sole. This alteration must be worn until the muscles have regained full tone under proper exercise.

JOHN MITCHELL, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Woltman, M. W.: Spina Bifida. *Minnesota Med.*, 1921, iv, 244.

Spina bifida is interesting because it presents a perplexing biological phenomenon. It is one of the most common deformities, making up one-sixth of all monstrosities; it occurs once in from 1,000 to 2,000 births. The condition was named "spina bifida" by Tulpus in 1641. The Greek designation "rachischisis" is reserved for the most marked type in which the entire medullary canal fails to close.

Two types of the defect are found: spina bifida cystica and spina bifida occulta. The majority of the cases are of the former type. This is subdivided into meningocele, which includes the walls composed of the meninges; myelomeningocele, which includes the meninges and cord; and syringomyelo-

cele, in which the central canal of the cord is dilated. A condition closely allied to spina bifida is a developmental defect of the spinal cord called "myelodysplasia" which is found without demonstrable bony change. Spina bifida is usually posterior but may be lateral or anterior.

Many theories as to the etiology of spina bifida have been advanced. Some have ascribed it to adhesions, either amniotic resulting from amniotitis with hydramnios or those due to lack of separation of the skin from the medullary plate. Others have attributed it to hydromyelia from excessive secretion of the choroid plexus or its faulty absorption. The resulting cyst may be interposed as a bulging mass between the lateral mesodermal structures and thus prevent approximation and fusion of the lips of the medullary groove. In favor of this theory is

the fact that spina bifida is frequently associated with hydrocephalus. The latter is made worse or is produced by operative closure. Amyelia, or complete absence of the cord, must be explained by a more comprehensive theory. There is much evidence against the assumption that the defect is germinal or developmental. That heredity may sometimes be a factor, however, is evidenced by the reports of cases in which the condition occurred in two or more generations.

Much experimental work in the artificial production of monsters in lower animals by chemical, physical, and mechanical means demonstrates the complexity of the problem. These results, in addition to the clinical facts, prove that spina bifida cannot be attributed to any single factor.

Roentgenologists believe that spina bifida occulta is so common that it may be considered almost a normal variation which has little or no bearing on the cause for which the patient is referred for examination. It must be remembered that the incomplete development of bone in children under 9 years of age makes their examination by the X-ray unsatisfactory.

Hypertrichiasis is not common. In 8 per cent of the cases the tumor is located in the cervical region. The sacral dimple is a defect frequently noted and, when persistent, signifies a developmental sacral defect.

In many cases there is deformity of the feet. This may be the result of muscular paralysis or developmental error. The paralysis is usually flaccid, but in 5.8 per cent of cases it was spastic in type.

To ascertain the relative prevalence of muscular paralysis, sensory disturbance, and incontinence, 49 patients over 5 years of age, excluding those with

spina bifida occulta without involvement of the nervous system, were studied as a group. Eighty-four per cent showed evidence of cord involvement. Sphincter disturbance was most common, being present in 71 per cent and the only evidence of cord involvement in 14 per cent. Motor paralysis was present in 53 per cent. Sensory disturbances were present in 45 per cent, but in no instance occurred independently.

Enuresis, another common symptom, may be discovered early or develop later in life. All trophic ulcers noted in the feet of the patients studied occurred after the fifteenth year of age. The case histories of 9 patients of the series are given.

The prognosis and treatment depend on the type of the defect. Increasing hydrocephalus and marked paralysis of the lower extremities are definite contra-indications to operation. Incontinence, which is usually given as a contra-indication, may be improved following operation. The optimum age for operation is between the ninth month and the second year of age. The operative mortality in 57 cases was 21 per cent.

The type of operation makes little difference. There is no need for overcoming great pressure or for unusual protection. Therefore complicated procedures, such as bone transplantation, are to be discouraged. Simple closure by a running suture from the bottom outward after the cord and nerve elements have been freed and dropped back into the canal is advised. In cases of spina bifida occulta operation should not be performed routinely; it is best to wait for the development of secondary changes. Such patients should be given the benefit of exploration as laminectomy is now a comparatively safe procedure. MERLE R. HOON, M.D.

SURGERY OF THE NERVOUS SYSTEM

Riquier, G. C.: The Fascicular Systematization of Peripheral Nerve Trunks (Sulla sistematizzazione fascicolare dei tronchi nervosi periferici). *Polidlin.*, Roma, 1921, xxviii, sez. med., 71.

The author has studied the functional systematization of the fasciculi of the ulnar nerve, and particularly an area about 6 cm. in length in the epitrochlear portion of this nerve. The ulnar nerves of foetuses, infants, adults, and old persons were examined.

The first finding made confirmed Dustin's discovery that the fasciculi frequently vary in number, being relatively numerous at one point and converging into a single thickened fasciculus at a lower point. According to this finding the view that the fasciculi increase in number but diminish in volume as they progress from the origin of the nerve to the periphery is erroneous.

A second finding was that, while changing in number, the fasciculi do not change their position within the nerve cylinder. It was established also that there are anastomoses between the fasciculi

of adjacent segments; that the fasciculation of the ulnar nerve varies greatly in different persons and even in the same person; and that there is no substantial difference between the fasciculation in foetuses and adults.

The chief point established was that, though in given segments the fasciculi may increase or decrease in number or volume at certain levels, they remain in the same position. Because of this definite order an isolated contraction of muscles or groups of muscles occurs following the direct excitation of different points on the perimeter of the nerve. Whether the findings for each nerve and the distribution of the motor and sensory fibers in a given nerve are constant must be determined by further clinico-experimental research. Neurology and surgery have direct excitation at their disposal to establish the identity of individual fasciculi or groups of fasciculi. The distribution of the nerve fibers in the mixed nerves of the limbs is a problem of great scientific interest and practical importance.

W. A. BRENNAN.

Platt, H.: The Surgery of the Peripheral Nerve Injuries of Warfare. *Brit. M. J.*, 1921, ii, 596.

Platt reports a series of 510 operations for peripheral nerve injuries. In 248 cases it has been possible to trace the results over periods of six months or more. The 248 operations included 150 cases of end-to-end suture, 80 cases of neurolysis, and 18 cases of bridge operations.

In 150 cases of end-to-end suture of the various nerves, recovery is reported in 118 (79 per cent) and failure in 32. The results with regard to the recovery of various functions in the different nerves are shown in a table. In very few cases has there been more than a slight recession of analgesia or an incomplete restoration of protopathic sensibility. The influence of the time factor is definitely proved. As a rule sutures made within a period of eighteen months show only slightly appreciable differences in the time of recovery. After a delay of two years recovery is often tardy or incomplete, or does not occur at all. The degree of delay within the safe period does not influence the percentage of recoveries, but seems to prejudice the ultimate quality and type of regeneration.

Spontaneous infection does not always seem to influence the regenerative process but definite recession of regeneration has followed exploration of an associated ununited fracture. Delay or cessation was invariably noted in the presence of a trophic ulcer, and in such cases was probably due to absorption of distal sepsis by the regenerating nerve. Recovery in the proximal muscles begins at an earlier or later date according to the proximity of the suture to the spinal cord. Distal recovery also shows these differences in time relation.

The inaccuracies of regeneration due to the shunting of motor fibers along sensory channels and vice versa are undoubtedly one of the causes of failure or imperfection of recovery.

It does not appear that the perineural surroundings influenced the recovery in any way except in a few instances in which the nerve trunk has been subjected to the friction of a bony groove.

Previous ligation of an important artery does not seem to have an appreciable effect on the rate or degree of recovery. Continued non-union of a fracture without inflammation in the neighborhood of the nerve retarded or prevented recovery in 2

cases of musculospiral suture. The continuance of active interstitial neuritis in the proximal nerve is a potent cause of delay or failure which, theoretically, may be avoided by making a free resection preparatory to suture. The neuritis may be perceived only on microscopic examination.

Success depends not merely on the restoration of adequate motor and sensory conduction, but on the development of co-ordination in the particular movements in which the afferent and efferent supply of the sutured nerves are concerned. This latter result is seldom, if ever, completely attained.

Improvement after neurolysis has occurred in 75 per cent of the cases, but it has been impossible to prove that the operation itself determined this result.

A series of 25 operations for causalgia are reported. In 18 the median nerve was involved, in 10 the sciatic nerve, and in 1 the internal popliteal nerve. The median nerve operations consisted of resection and suture in 11 cases, neurolysis in 2 cases, and intraneural injection of quinine and urea in 1 case. Complete relief followed resection and suture in 9 instances but in one case in which the operation was performed twice on the same nerve the pain persisted though it was less severe. Both neurolysis operations failed to relieve, and in both of these cases resection and suture were carried out subsequently with complete success. Injection of quinine and urea gave moderate immediate relief, and the pain showed signs of diminution with ultimate disappearance in a few months.

The efficacy of early resection and suture for severe causalgia is beyond criticism.

If the operations discussed are not indicated, as in irreparable musculospiral injuries, tendon transplantation may be done. In the lower limb the destructive operation of tenodesis of the ankle may be performed as an alternative to the life-long wearing of an apparatus.

In a new procedure introduced by Harris of Toronto the proximal end of the radial nerve is implanted into the median nerve at the wrist in an attempt to restore lost sensory function in the median area which produces grave incapacity. This operation may be worth a trial in the treatment of the few irreparable lesions of the median nerve in the forearm.

CLAYTON F. ANDREWS, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Amberg, E.: Some of the More Important Measurements of Parts of the Temporal Bone. *Laryngoscope*, 1921, xxxi, 147.

This article quotes measurements of the outer ear canal, drum membrane, tympanic cavity, including the epitympanic cavity, the ossicles, the eustachian tube, the mastoid antrum, the mastoid process, the

lateral sinus, the labyrinth, and the meatus acusticus internus, and discusses the clinical application of the figures quoted.

To determine the location of the lateral sinus line in adults Amberg has devised a guide, one shank of which is held over the anterior border of the mastoid process and the other over the temporal line. In this position the direction of the lateral sinus line is given by the handle of the guide.

O. M. ROTT, M.D.

Diez, S.: Glycosuria, Diabetes, and Trauma (Glicosuria, diabete e trauma nell' infortunistica). *Policlin.*, Roma, 1921, xxviii, sez. prat., 431.

It has long been known that injuries, especially of the head and spinal column, may cause temporary glycosuria. Jacksch, Strumpell, and Strauss found glycosuria in 36 per cent of their cases of injuries of the head and spinal column. Numerous authors report glycosuria resulting from injuries of other parts of the body, even of the limbs. Others deny that it can be caused by peripheral injuries. Diez believes it probable, however, that peripheral injuries produce glycosuria by causing nervous shock. Psychic disturbances, such as fear and grief, may also be responsible.

The percentage of cases of diabetes in which there is a history of trauma as given by various authors varies from 2 to 10 per cent. As a rule the glycosuria following trauma does not go on to true diabetes, but disappears after about two years. Ferraninni holds, however, that diabetes may be caused by trauma in persons who have not the slightest predisposition to it.

The symptoms of traumatic diabetes are in general the same as those of spontaneous diabetes, though Brouardel emphasizes the frequency in the traumatic form of nervous symptoms such as insomnia, psychic depression, delirium, headache, vertigo, and sensory disturbances. It is possible also that trauma may cause both diabetes and a traumatic neurosis at the same time.

The question as to whether diabetes following trauma is caused by the injury or is merely a latent diabetes which has been awakened is not of great importance from the medicolegal point of view as the patient is entitled to damages in either case. Every precaution must therefore be taken against malingering as cases have been known in which the plaintiff put sugar into the urine, mixed the urine of a diabetic with his own, injected sugar into the bladder, or took phloridzin either by mouth or by injection. In the awarding of damages it is necessary to consider also the danger to which a diabetic is exposed in any necessary operation. A person with diabetes should not be assigned to work in which he is apt to be subjected to trauma.

AUDREY G. MORGAN, M.D.

Ingebrigtsen, R.: Physiological Healing of Superficial Wounds (Ueber physiologische Heilung von Oberflaechenwunden). *Norsk mag. f. Lægevidensk.*, 1920, lxxxi, 1153.

The laws which determine the healing of wounds by second intention have recently been studied by Carrel. Superficial wounds healing aseptically decrease in size according to a regular curve. This curve, which has been studied by the physicist, Lecomte du Nony, may be expressed algebraically in two equations. The wounds were kept aseptic by means of Dakin's fluid, which sterilizes but has no specific activating effect on the process of healing.

The author studied the healing process in seven superficial wounds after the use of 3:1,000 nitrate of silver solution followed by heliotherapy. He found that when superficial wounds are treated in this manner they heal more rapidly than aseptic wounds treated only with the sterilizing Dakin's solution.

KORITZINSKY (Z).

SERA, VACCINES, AND FERMENTS

Kendall, E. C.: The Chemical Influence of the Active Constituents of the Ductless Glands. *Surg. Gynec. & Obst.*, 1921, xxxii, 205.

Each ductless gland elaborates one or more definite chemical substances which are contained in its specific secretion, but the active constituents have been isolated from only two glands. The active constituent of the posterior lobe of the pituitary has not been isolated, but it is known that in some respects its action resembles that of histamine.

The active constituent of the medulla of the suprarenal was investigated in 1901 by Abel, Takamine, and Aldrich. Epinephrin is a distinctly crystalline substance and can be synthesized at a moderate cost.

During the synthetic preparation of epinephrin equal amounts of so-called right-handed and left-handed epinephrin were found. The left-handed epinephrin possesses physiological action identical with that of the natural substance. It would appear that this specific chemical structure of epinephrin fits some chemical mechanism within the body as a key fits a lock.

For nineteen years the only known chemical difference between the thyroid and other ductless glands was the presence of iodine. The iodine-containing compound of the thyroid was first isolated in pure crystalline form by the author in 1914 and named "thyroxin." Since that time the identification of the compound has been completed. Thyroxin is a white crystalline substance which has the properties of a very weak acid. It is insoluble in water, but readily soluble in sodium hydroxide.

The active constituent of the thyroid gland has been known clinically for about twenty-five years. Thyroxin will bring about the same changes in the thyroid-deficient patient as the administration of desiccated thyroid. The response to thyroxin does not begin until several hours after its intravenous injection. Plummer has shown that the maximum effect in the myxoedematous patient is reached in about seven days, and that definite physiological effect is continued for at least twenty-four days. When the correct minimum dose is determined, it is possible to maintain a normal metabolic rate irrespective of the rate when the patient began taking thyroxin.

The exact relation between the basal metabolic rate and the amount of thyroxin administered suggests that some definite balance is maintained within the body between the amount of thyroxin circulating in the blood and that functioning in

the tissues. The relation, of course, must be maintained by the proper activity of the gland. The author has shown that the normal iodine content of the blood is 0.013 mg. per 100 c. cm. The iodine content of the thyroid is higher in summer than in winter, while the iodine content of the tissues is higher in winter than in summer. This suggests that the iodine content of the body is constant, but is stored in the gland when less is needed by the tissues for the production of energy for heat. Excess thyroxin excreted by the liver appears in the bile. The great difference between epinephrin and thyroxin is that the former acts immediately and for only a short time, while the latter does not begin to function until after many hours and continues for about three weeks.

G. S. FOULDS, M.B.

Izar, G.: Incidents, Accidents, and Consequences of Intraspinal Serotherapy (Incidenti, accidenti e conseguenze nella sieroterapia endorachidiana). *Rassegna internaz. di clin. e terap.*, 1921, ii, 33.

The accidents likely to occur in intraspinal serotherapy may be divided into: (1) those due to the operative act; (2) those caused by the introduction of the serum.

The first group includes mishaps resulting from the introduction of the needle in the wrong direction or region, failure in diffusion of the fluid, breakage of the needle, and puncture of a spinal root, the cord, or an important blood vessel.

In the second group are included an increase of intracranial pressure, aseptic meningeal reactions, and the phenomena of anaphylaxis (the anaphylactic phenomena of Arthus, and general anaphylactic phenomena).

In view of the possibility of such complications, especially in patients not previously treated by serum, it is well in every case to make a prior preventive subcutaneous injection of from 5 to 10 c.cm. of serum. Even when this is done, however, one cannot be sure that the phenomena of anaphylaxis can be avoided because, when the serum is introduced subcutaneously, they may appear after a long period of time. If subcutaneous injection gives rise either to general disturbances (cyanosis, erythema, epigastric pain, etc.) or to local phenomena (oedema, erythema, pruritis), the intraspinal injections should be postponed until, following repeated injections of small doses, there are no reactions of consequence. It is then well to begin the spinal injection with a small dose and increase the dosage progressively.

When the injections are given in series and the treatment has been intense the injections should be stopped for a while after the seventh to ninth day, and when they are resumed the rules observed for the first injections should be followed.

As a preventive measure against anaphylactic phenomena the author has found it advantageous to give adrenalin by mouth in doses of 5 to 20 drops two or three times a day according to the patient's age.

W. A. BRENNAN.

BLOOD

Petrén, G.: Coagulation Time in Icterus (Untersuchungen ueber die Blutgerinnung bei Icterus). *Beitr. z. klin. Chir.*, 1920, cxx, 501.

The author determined the coagulation time of the blood of 20 persons between 15 and 81 years of age who were suffering from various diseases. These determinations were used as controls for similar determinations which were made in cases of icterus to estimate the danger of cholæmic hæmorrhage.

Schlossman holds that if the coagulation time is delayed by as much as a third of the normal the general operative prognosis is unfavorable. In some of the 29 cases of icterus studied the author found that the coagulation time was three or four times as long as normal, while in others it was entirely normal. Of 11 patients operated upon, 6 had a normal coagulation time before the operation. Of these 6 patients 4 recovered uneventfully, and 2 had slight hæmorrhages. Of 4 patients with an abnormally long coagulation time before operation, only 1 escaped hæmorrhage; 2 had a slight hæmorrhage and 1 a fatal hæmorrhage. In 1 who had a normal coagulation time immediately before the operation the time had been previously 40 per cent longer than normal and spontaneous cholæmic hæmorrhage had occurred. This patient died of postoperative hæmorrhage.

Petrén concludes that in slight catarrhal icterus the coagulation time is not affected, but in severe cases it is lengthened. If it is lengthened to more than three or four times the normal, operation is contra-indicated.

In the second part of the article the author discusses the effect of bile acids on the blood. The term "cholæmia" is not appropriate for the bile probably has very little to do with the syndrome to which it is applied. It would be better to speak of the condition as hepatic insufficiency or intoxication. The etiology of the so-called cholæmic hæmorrhages is not definitely known; they may be due to bile acids in the blood or to some disturbance of liver function. The author found by experiments that the bile acids slow coagulation time, there being no essential difference between glycocholate and taurocholate. Amounts of bile salts less than 0.17 to 0.2 per cent do not have any effect on the coagulation time *in vitro*, and probably concentrations of less than 0.17 per cent have no effect during life. The greater the concentration the greater the danger of cholæmic hæmorrhage.

From his studies on patients with icterus Petrén comes to conclusions which he summarizes briefly as follows:

If the amount of bile salts in the blood is normal there is little danger of cholæmic hæmorrhage after operation, though it is still possible. If the bile-salt content of the blood is one-third to one-fourth lower than normal there is a certain degree of danger of postoperative cholæmic hæmorrhage. If

the amount is one-half normal or less, the danger is so great that it should be regarded as a contra-indication to operation.

The bile acids in the blood are not the cause of so-called cholæmic hæmorrhage. In dogs with icterus caused by the ligation of the common duct the blood retained its normal coagulability until the death of the animals between two and three months later. The author never observed cholæmic hæmorrhage in dogs, and has not found any reports of it in the literature.

VON TAPPEINER (Z).

Hilgenberg, F. C.: Hæmostasis Effected by Implanting Muscle and Its Clinical Application (Ueber Blutstillung durch Aufpflanzung von Muskelstueckchen und ihre klinische Anwendung). *Beitr. z. klin. Chir.*, 1921, xxxi, 468.

The method described, which was first used by Horsley and Kocher and further developed by Laewen, consists in pressing or suturing small flaps of muscle taken from the neighboring tissues to bleeding areas in which the hæmorrhage cannot be controlled by other measures. Muscle implantation is better than tamponade in that the wound can be closed primarily, and is better than ligation in that it causes no injury to tissues or nutritive disturbances.

As is shown by a large series of cases, the method has been effectually used in cases of hæmorrhage from goiter, the liver, lungs, heart, blood vessels and angiomas, and in the closure of veins in air embolism and pneumothorax. It cannot be used, of course, in injuries of large vessels, but is of value when applied to parenchymatous, vascular organs, soft, friable tissues, bone cavities, and sinuses.

SIEVERS (Z).

BLOOD AND LYMPH VESSELS

Turco, A.: A Case of Causalgia Treated by Decortication of the Artery (Un caso di causalgia trattato con la decorticazione dell'arteria). *Polinclin.*, Roma, 1921, xxviii, sez. chir., 127.

Causalgia was first described in 1813, but was given its name in 1864 by Weir Mitchell. Leriche in 1916 first formulated the theory that it was due to vasomotor disturbances caused by injury of the sympathetic fibers in the perivascular sheath. As a method of treatment he suggested the resection of a part of the sheath of the artery in the region affected.

Causalgia is most apt to occur in lesions of the median and sciatic nerves. The pain is burning in character and varies with the changes in the vascular tone. Leriche believes that pressure from cicatricial tissue causes irritation in the perivascular sympathetic plexus. Acting on this theory he performed his operation of decortication of the artery in 11 cases. The results were good.

The author describes the case of a man of 42 who had attempted to commit suicide by cutting the radial artery. The wound caused loss of sensation

in the palm of the hand, almost complete loss of motility of the thumb, a decrease in the motility of the other fingers, atrophy of all the muscles of the hand, and trophic disturbances evidenced by coldness, cyanosis, and formication. Later there were circulatory disturbances, with blisters which broke down and formed ulcers and intense burning pain.

Seven months after the injury the median nerve was exposed and found embedded in scar tissue. The external scar was excised and the nerve fibers carefully dissected free from the remaining scar tissue. This operation was followed by improvement in sensation and motion, but the trophic disturbances and the pain continued. A year and a half later the patient returned because of intense pain. The hand was then swollen and it was almost impossible to move the fingers. The pulse at the wrist was weaker than that on the other side. As the symptoms were evidently sympathetic in origin, Leriche's operation was performed, the sheath of the artery being excised for a distance of 7 cm. Complete recovery from all symptoms resulted. This case therefore confirms Leriche's hypothesis.

The article is supplemented by a bibliography of 18 titles.

A. D. MORGAN, M.D.

Druener, L.: A Case of Suture of the Right Common Carotid and Temporary Ligation of Large Vessels (Ueber einen Fall von Naht der rechten Carotis communis und die zeitweilige Unterbindung grosser Gefaessstaemme). *Zentralbl. f. Chir.*, 1921, xlviii, 191.

The author reports a case in which he laid bare an arteriovenous aneurism the size of a cherry between the right common carotid artery and the internal jugular vein. He resected 5 cm. of the jugular vein and temporarily ligated the carotid above and below. He then sutured the opening in the carotid and covered it with a piece of the sac of the aneurism. When the temporary ligation of the carotid was released there was a good flow of blood through the artery without leakage. The patient awoke from the anæsthesia in the afternoon, spoke, and moved his limbs. Three hours later hemiplegia of the left side developed and in four hours was followed by death. There was no embolism; the right cerebrum was anæmic, but otherwise showed no changes. At the point of suture in the right common carotid was a fresh thrombus.

In this case the free interval was due to the slow rate at which the thrombosis developed. The lesion of the right brain, however, was brought about, not by embolism, but by insufficiency of the blood supply through unobstructed vessels. For this there is no completely satisfactory explanation. The author believes that the anæmia of the right brain may be attributed to the fact that all the blood was carried by the left carotid. A similar condition is not to be expected in all cases of ligation of the carotid near the bifurcation as in one of the author's earlier cases there was no such trouble.

Druener is not convinced that circulatory disturbances are caused more frequently by the setting free of thrombi in the blood stream and that the formation of thrombi can be prevented by ligation with strips of tendon by Perthes' method. In ligation of the common carotid he believes there is danger of embolism, but it is less than the danger of scar formation. He never makes temporary ligations with silk. Instead, he uses a method similar to that of Perthes. After drawing a thin drainage tube under the artery he places over it a short piece of drainage tube with walls about as thick as the arterial wall or somewhat thicker. Over this he ties the thin tube, ligating the vessel and the thicker tube.

GLASS (Z).

Giorgi, G.: Suture of the Portal Vein (Sutura della vena porta). *Clin. chir.*, 1920, n. s. ii, 903.

The only other case of suture of the portal vein which has been reported was a case of suture of an injury during operation. The patient died. The author describes the first case of successful suture of the portal vein. In a gunshot wound of the back the bullet made a large wound in the liver and passed through the lesser omentum into the portal vein. The wounds in the liver and the vein were sutured. Bits of metal were found also in the lumbar cord. The patient recovered and today, four months after the operation, shows no ill effects.

AUDREY G. MORGAN, M.D.

Pasman, R. E.: MacArthur's Method in the Treatment of Obliterating Endarteritis (El método de MacArthur en el tratamiento de la endarteritis obliterante). *Rev. Asoc. méd. argent.*, 1920, xxxiii, 146.

In obliterating endarteritis the usual methods of treatment, including arteriovenous anastomosis and ligation of the femoral vein, may fail. When this is the case amputation is necessary. Koga of Tokio suggested modifying the viscosity of the blood by massive injections of salt solution. MacArthur of Chicago, to avoid the inconveniences of such injections, substituted duodenal irrigation with Locke's solution.

Pasman refers to two cases of obliterating endarteritis in which, after other methods had failed, he obtained distinct amelioration from the use of Locke's solution for ten days. In another case notable improvement was evident after fourteen duodenal irrigations of 4 liters each. In a fourth case the lesion was present originally on both feet. After six months' use of the fluid it disappeared from one limb but a thigh amputation was necessary on the other side.

The author is unable to explain the action of the solution in suppressing pain in some cases and rendering amputation unnecessary or postponing it in others.

He suggests that intestinal irrigations might be useful in other conditions such as functional kidney disturbances.

W. A. BRENNAN.

Garland, J.: Aneurism of the Splenic Artery Rupturing Simultaneously with Paracentesis Abdominis. *Boston M. & S. J.*, 1921, clxxxiv, 385.

A case is cited in which, during an abdominal paracentesis, the patient collapsed and died. An autopsy performed by Richardson determined the presence of an aneurism of the splenic artery which had ruptured simultaneously during the abdominal paracentesis.

The lesion described is rare. In the case reported the reason for the rupture during the operation can be only conjectured. The psychic effect of the paracentesis might have temporarily increased the blood pressure or the withdrawal of a liter of fluid from the abdomen might have caused a relative drop in the pressure of the structures surrounding the aneurism. It is difficult to believe that the rupture was due to a simple coincidence. Direct trauma from the trocar was shown at autopsy to have been quite impossible.

In over 4,100 autopsies at the Massachusetts General Hospital aneurism of the splenic artery was discovered only three times. The author has found the reports of 17 cases in the literature. In the most recent case, that reported by Hogler, the diagnosis was made during life.

A. R. HOLLENDER, M.D.

Fraser, J., and McCartney, J. E.: A Case of Persistent Vitelline Artery: Fatal Intra-Abdominal Hæmorrhage from Rupture of the Vessel. *Brit. J. Surg.*, 1921, viii, 478.

A baby, four months old, in good general health, was brought to the hospital on account of a small pea-sized tumor of granulation tissue which grew by a narrow pedicle from the deeper portion of the umbilicus and had a persistent irritating discharge from its surface. The tumor was lifted out and the pedicle divided with a cautery. In twenty-four hours the child began to vomit and within forty-eight hours of the operation it died. No diagnosis other than delayed shock could be made.

At autopsy, blood was found in the peritoneal cavity. A thin fibrous cord $1\frac{1}{2}$ in. in length stretched from the umbilicus, a little to the left of the midline, to the mesentery of the ileum about 18 in. from the ileocecal valve. The actual attachment of this cord to the mesentery was hidden by a hæmatoma. At the apex of the hæmatoma was a small hole from which the blood had escaped into the peritoneal cavity.

It was found that the cord was attached to the superior mesenteric artery and was the persistent left vitelline artery with a completely obliterated lumen. Opposite it, a small branch arising from the superior mesenteric artery had been torn, this tearing being responsible for the hæmorrhage.

In lifting the tumor, traction had been exerted on the vitelline artery and through it on the main vessel, thus causing the rupture of the small vessels. Diagrams illustrate the development of these vessels.

H. O. FOUCAR, M.D.

GENERAL BACTERIAL INFECTIONS

Manoukhin, I. I.: The Treatment of Infectious Diseases by Leucocytolysis Produced by Roentgenization of the Spleen. *Lancet*, 1921, cc, 685.

The author describes leucocytolysis as the process by which in infectious diseases the leucocytes are broken up by special soluble ferments of the blood which he calls "leucocytolysins." Other ferments, which are soluble and have the property of opposing the leucocytolysins, he terms "anti-leucocytolysins." The former are produced by the spleen, the latter by the liver.

These hypotheses were substantiated by a series of experiments on animals. Monkeys and guinea pigs were infected with human tuberculosis and leucocytolysins were produced in the blood by stimulating the spleen with small doses of roentgen rays.

In applying the roentgen rays care was used not to expose the liver in order to prevent the formation of anti-leucocytolysins. In animal experiments the dosage was graded according to the extent of the leucocytolysis and the species of the animal. In the cases of patients suffering from infectious diseases exposures were made from the front and back with screening over the liver, and the dose was varied according to the gravity of the case.

Radiation of the spleen of monkeys and guinea pigs appears to increase the proportion of alexin and specific antisubstances in the blood such as hæmolysins, agglutinin, bacteriolysins, and opsonins. By inoculating guinea pigs with human tuberculosis and testing the blood by the Bordet-Gengou reaction with the tuberculin of Besredka and at the same time investigating the leucocytolytic properties of the blood the author was convinced that the curve of fluctuation of specific antisubstances corresponded to the curve of fluctuation of the leucocytolysis.

Since 1913 various infections have been treated. During the war the roentgen ray was applied to the spleen in cases of typhoid fever. The mortality, which had been about 40 per cent, was reduced one-half. Subsequently an attempt was made to increase the effect by introducing various antisubstances into the blood. An auto-serum obtained from blood of the patient from eight to ten minutes after roentgenization was given in gelatin capsules. The mortality was then reduced seven and one-half times. In a series of 225 patients not treated by this method the mortality was 19.1 per cent, while in a series of 351 patients treated by radiation of the spleen alone it was 9.7 per cent, and in series of 305 treated by radiation of the spleen and the administration of anti-serum it was 2.6 per cent.

In cases of tetanus treated by means of antitetanus serum the mortality was 92.98 per cent. In tetanus cases three inoculations daily of 20 c.cm. of serum were given under the skin and 10 c.cm. were injected intrathecally together with 10 c.cm. of the auto-serum obtained from the blood eight to ten minutes after roentgenization of the spleen. By this treatment the mortality in 132 cases was

reduced to 27.3 per cent which was exceptional for war time. Roentgenization of the spleen, besides immunizing the body to the toxins of tetanus, removed the effect of the serum anaphylaxis.

Roentgenization of the spleen was used also in the preparation of curative sera. In addition to immunization of horses against the toxins of tetanus (and against bacillus typhosus, bacillus dysenteriae, and vibrio cholerae asiaticae) roentgenization of the spleen was done. In this way curative sera of high concentration were obtained in a shorter time and at lower cost.

The diseases treated were rheumatism, acute malaria, acute bronchitis, pneumonia, pleurisy, typhus, and dysenteric and non-infectious diseases of the pulmonary and intestinal systems. All responded favorably. Cases of pulmonary tuberculosis were treated according to the stage of the disease and the patient's condition. It was found that there is often a rise in temperature and an increase in the general symptoms after the first treatment. In the first stage of pulmonary tuberculosis eight or ten treatments usually brought about a cure. The second stage required twelve to fifteen treatments, and the third stage usually two series of twelve to fifteen treatments at three month intervals. The X-ray examinations and general physical findings in these cases have shown remarkable improvement. Excellent results have been obtained also in tuberculosis of the kidneys, bladder, lymphatic glands, and bones, tuberculous peritonitis, and non-acute meningitis treated by roentgenization of the spleen in addition to surgical procedures.

F. B. SETTLE, M.D.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Schuessler: The Use of Pepsin-Hydrochloric Acid for Scars (Die Anwendung von Pepsin-Salzsäure zur Beseitigung von Narbenzug). *Muenchen. med. Wchnschr.*, 1921, lxviii, 72.

The author adopted the Patzschke and Unna method of treating cicatricial tissue with pepsin and hydrochloric acid. Griessmann obtained good results with this procedure in Dupuytren's contracture. Schuessler used salve and moist compresses in the strength recommended by Patzschke (10 per cent pepsin, 1 per cent hydrochloric acid, 1 per cent carbolic acid), but in many cases he substituted boric acid for the hydrochloric acid. The salve was rubbed into the scars twice daily. No protective dressing was applied. Moist compresses were used only at night and only on parts of the body where they could be applied easily. In connection with this treatment, gymnastics, hot applications, and massage were prescribed.

Schuessler reports 11 cases. From his experience he concludes that the method is of value in treatment of all large scars as soon as they are completely covered with skin. Mechanical after-treatment will then give much better results. GLASS (Z).

Nuernberger: Presacral Injection for Therapeutic Purposes (Ueber praesakrale Injektionen zu therapeutischen Zwecken). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 230.

Nuernberger recommends sacral injections for sacral pain in the climacteric, functional pains in neurasthenia and hysteria, and the pain due to posterior parametritis, adhesions of the pelvic peritoneum in the vesico-uterine pouch, coccygodynia, and sciatica.

The injections are unilateral or bilateral, depending on whether the pain is on one or both sides. An injection needle 15 cm. long is inserted horizontally at a point $1\frac{1}{2}$ to 2 cm. to the side of the tip of the coccyx and moved from one sacral foramen to the next. In each foramen about 20 c.cm. of a 0.1 per cent beta-eucaine solution are injected. If the pain is bilateral the individual injections are somewhat smaller in order that not more than 140 c.cm. of the eucaine solution is used altogether. The injections are made under ethyl chloride anaesthesia.

In seven cases reported the results were good. Nuernberger believes that in some instances the effect is purely suggestive, but that in others there is a certain amount of pharmacological effect in addition to the hydrodynamic effect. **PLENZ (Z).**

Peiper, H.: Reduction of the Suprarenal Glands in Epilepsy (Nebennierenreduktion bei Epilepsie). *Zentralbl. f. Chir.*, 1921, xlviii, 407.

Attempts have been made in the Schmiedon clinic to cure by extirpation of one suprarenal gland severe cases of epilepsy which would not yield to any other treatment. The results were astonishingly good at first, but after a longer or shorter interval the attacks reappeared. For the present, no further operations of this kind will be performed.

If any specific effect is exerted on epilepsy by a reduction in the suprarenal secretion, the failure of such treatment must be due to vicarious hypertrophy of the remaining suprarenal such as has been found to occur in young animals. Bruening, who first proposed the operation, thinks that for this reason better results are promised in mature persons. In this connection the author calls attention to the fact that following deep roentgen irradiation of epigastric fields he noticed a browning of the skin which was probably due to injury of the suprarenals. He will give a more detailed report of this later. **KNOKE (Z).**

Davis, J. E.: Some Factors That Determine Tissue Resistance to Cancer. *Am. J. Obst. & Gynec.*, 1921, i, 668.

Complexity of organization limits the resistance of individual cells in order that aggregate efficiency may be increased. Therefore the resistance of plants to neoplasia is superior to that of the vertebrate. The vertebrate, however, is better organized against mass invasion.

The life of a complex organism is the result of cell interactions and the internal metabolism of the

individual cells. Factors altering the foregoing are tolerated by the higher vertebrates only when there can be an accomplished conformation within a limited period of time such as occurs after amputations, resections, traumatizations, transplantation, and grafting.

The reactions following exhaustion, irritation, and a specific diet produce acidity, toxicity, and cytoplasmic sensitization as an expression of inter- and retro-active cell properties. Measurement of this reaction is of great clinical value.

Tissue changes before and after neoplastic invasion may be characterized by increased cellularity, invasive and extensive growth, hypernutrition, diminished elasticity, changed chemistry, cicatrization, induration, and fixation, and all are to be regarded as expressions of a defense mechanism initiated by cell enzymes or other products.

The essentials of inflammation and neoplasia are similar as, with adequate severity of irritant and periodicity of exposure, there is production of tissue unbalance, lawlessness, and dynamic cell growth.

Physiological growth, regeneration, and neoplasia utilize the same means to produce a product, and resistance is an essential cause for all three. Normal growth and regeneration are production under control; neoplasia is production without control.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Marquis and Lefevre: Is There a Retrograde Circulation from the External Toward the Internal Carotid After Ligation of the Common Carotid? (La circulation rétrograde de la carotide externe vers l'interne après ligature de la carotide primitive, existe-t-elle?) *Rev. de chir.*, Par., 1920, lxxviii, 680.

There are four classical routes by which the cerebral circulation is re-established after ligation of the common carotid: the vertebral and the internal carotid on the healthy side, and the vertebral and the retrograde circulation of the external toward the internal carotid on the side of the ligature.

The existence of the first three routes is evident, but our knowledge of the rôle of the fourth is based only on the following facts:

Hæmorrhage from a wound of the common carotid artery will not be arrested by a ligature placed below it. The blood comes from above by what is known as retrograde circulation. Whether or not the hæmorrhage from above peripheral to the common carotid proves a reflux from the internal or from the external carotid cannot be determined under ordinary operative conditions. The necessity for ligation of the internal carotid occurs only rarely. In facial surgery, however, the external carotid is not uncommonly ligated, and in such cases the occurrence of a retrograde circulation was noted in ligation of the external as well as of the common carotid. Since the blood can reflow from the

periphery toward the heart, it was concluded that the retrograde circulation in the common carotid was due to a retrograde circulation in the external carotid and that therefore if the common carotid were ligated, its two branches being spared, the blood could flow from the external to the internal carotid and thence to the cerebrum. Accordingly it seemed that after ligation of the common carotid the retrograde circulation occurred from the external toward the internal carotid. The authors' experiments were made in an effort to prove the existence of this circulation, but to their surprise the very opposite condition was found.

From a comparison of the number and the importance of the anastomoses between the external carotids and the internal carotids the circulation can be explained only on probabilities. There is an anastomosis between the two external carotids, between the ophthalmic branches of the internal carotid, and between the two internal carotids by means of the circle of Willis. There is another anastomosis which joins the vertebral and the internal carotid by the intermediation of the basilar trunk and the circle of Willis (postcerebral and postcommunicating arteries). The course of this anastomosis is direct and the lumina of the arteries which constitute it are relatively large. The measurements of these arteries in man after moderate distention by injection are as follows: diameter of vertebral, 3 mm.; basilar trunk, 4 mm.; post-cerebral, 2.5 mm.; post-communicating artery, 1.8 mm.; and internal carotid at its confluence with the circle of Willis, 4 mm.

The measure of the pressure in the peripheral ends of the internal and external carotids and the comparison of these values of pressure should give the necessary data to solve the problem under investigation. If the peripheral pressure is the same in the internal and external carotids it should provide a circulation of blood below the bifurcation. If the pressure is greater in the external carotid, the blood will pass below the bifurcation from the external to the internal carotid. If the pressure is greater in the internal carotid artery it will flow in the inverse direction.

In experiments performed on dogs and rabbits the pressures in the peripheral ends of the external and internal carotids were recorded with a mercury manometer and a kymograph. The common carotid was divided and connected with the recording apparatus. When the pressure in the external carotid was measured the internal carotid was clamped, and when the pressure in the internal carotid was measured the external carotid was clamped. The experiments on the rabbits were unsatisfactory, and therefore no definite data were obtained for this animal.

The experiments on dogs seemed to show that the pressure is greater in the internal carotid than in the external carotid by about 40 mm. of mercury. It cannot be concluded, however, that the conditions are the same in man as there is much difference in

the anatomical arrangement of the branches of the common carotid. In man the branches form a "Y," while in the dog the external carotid is larger than the internal carotid and lies in the line of direct continuation of the common carotid. The internal carotid branches off at a right angle from the main trunk.

Experiments on the human cadaver were performed soon after death. An artificial circulation having been established by means of water pressure and the arteries having been washed free of clots the pressures in the external and internal carotids were determined. The results showed that the pressure is between 60 and 70 mm. of mercury greater in the internal carotid than in the external carotid. Contrary to former ideas on this subject, these experiments proved that the retrograde circulation following ligation of the common carotid is established from the internal toward the external carotid.

FRENCH K. HANSEL, M.D.

Cornioley and Kotzareff: Experimental and Anatomopathologic Research on Traumatic Toxæmia (Résumé de recherches expérimentales et anatomopathologiques sur la toxémie traumatique). *Rev. de chir.*, Par., 1921, xl, 1.

The authors' experiments regarding traumatic toxæmia were carried out on rabbits and guinea pigs. The results of 17 experiments, which coincided in general with what is already known on the subject, are summarized as follows:

1. While a ligature remained in place above the crushing lesions the general phenomena of traumatic toxæmia remained slight or were absent.
2. When the ligature was suddenly removed after a period of a few hours during which no general morbid phenomena were noted the animal died very soon as the result of rapid absorption.
3. Amputation done immediately after a crushing injury and above the lesion saved the animal's life, and such animals did not at any time show symptoms of shock.
4. Intravenous or intraperitoneal injection of the sterilized and filtered product of muscle crushing caused death and the same physiological phenomena and macroscopic and microscopic lesions as those noted in animals with a crushing injury.
5. If a crushing injury was left exposed the animal did not at any time show toxic phenomena as the autolytic products were allowed to flow away. The fact that shock remained absent although the open and non-dressed wound could easily have become infected seems to prove that traumatic toxæmia is not due to bacteria.

The authors observed also a phenomenon analogous to that which Gley termed "tachyphylaxia." This consisted of rapid immunization against an organ extract produced by the injection of a small dose of this extract.

The increase in eosinophile polynuclears which is well known clinically as a reaction of the organism against the absorption of protein substances of

animal origin, the nitrogenous disintegration of the traumatized tissues and the liberation of free protein substances, the fact that proteins are especially toxic to the brain, and the mode of death of the experimental animals all point to the entrance of protein substances into the blood stream as the cause of intoxication of the nervous system and death from shock.

In civil practice early amputation in crushing limb injuries is repugnant to surgeons. The authors suggest that possibly early phlebotomy would diminish the stasis found in different organs, especially in the portal system, and would eliminate a part of the toxin which has already entered the general circulation. This should be followed by the injection of physiological salt solution, and if circumstances permit, by direct or indirect blood transfusion. In addition, medication to combat the deficiencies resulting from secondary cellular changes in the organs should be given. W. A. BRENNAN.

Murphy, J. B., Nakahara, W., and Sturm, E.: Studies on Lymphoid Activity. V. The Relation Between the Time and Extent of Lymphoid Stimulation Induced by Physical Agents and the Degree of Resistance to Cancer in Mice. *J. Exper. M.*, 1921, xxxiii, 423.

Two methods have been described by the authors by which definite stimulation of the circulating lymphocytes accompanied by hyperactivity of the lymphoid centers may be brought about. It was first noted that small doses of the X-rays induced this condition, but the reaction was of short duration as compared with the stimulation occurring in cancer-immune mice following inoculation with cancer. The stimulation induced by the X-rays was preceded by a period during which evidences of the destructive action of this agent on the lymphoid centers were noted and was followed by a period during which the stimulation phase alone was present. By the fourth day the proliferative activity was at its height and then quickly subsided.

The amount of stimulus produced by dry heat was much greater in extent and duration than that noted after exposure to the X-rays. Immediately after the application of the heat there were also marked evidences of cell destruction in the lymphoid centers, but as judged by the blood pictures the stimulation following was more prompt and also of greater volume.

As the close relation between lymphoid stimulation and the resistant state to cancer inoculation was quantitative in nature, it would be expected that mice whose lymphoid cells were stimulated by the X-rays would show a definite degree of resistance though less than that exhibited by animals following heat stimulation. This fact was borne out by the authors' figures on 102 mice to which heat was applied one week before inoculation. These animals showed an average immunity of 60.3 per cent, while 83 normal mice inoculated with the same tumors showed an average immunity of 16.5 per

cent. On the other hand, in 144 mice X-rayed from three to seven days before inoculation the immunity was 37.5 per cent, and in 137 normal mice inoculated with the same tumors, which were used as controls, the average immunity was 10.4 per cent.

If the hypothesis were true that stimulation of the lymphocytes of mice definitely reduced the number of takes of cancer grafts, it seemed to the authors of importance to know whether there was a difference in the resistance percentage when the tumor inoculation was made at varying times after the stimulus was administered. A series of experiments was therefore carried out to test this point. From the results it was seen that the resistance of mice inoculated with cancer immediately after a stimulating dose of the X-rays was no higher than that of normal mice, but on the average somewhat lower. On the other hand, the mice inoculated with cancer a week after a stimulating dose of the X-rays showed a consistently higher degree of resistance which revealed itself both in the number of takes and in the rate of growth of the tumor.

These experiments with the X-rays were paralleled with similar tests with heat as the agent used to stimulate the lymphocytes. The results indicated a definitely higher resistance in the mice inoculated immediately after the application of heat than in the controls, while the mice to which the heat was applied a week prior to inoculation showed an even more pronounced degree of immunity. The blood count after the heat treatment showed a sharp but very transitory drop in the number of circulating lymphocytes which was followed within twenty-four hours by a marked increase and a continuous rise in these cells lasting for a week or more. Histologic examination of the lymphoid organs of heated animals showed that by the end of forty-eight hours after the treatment these organs contained a larger number of mitotic figures in the germinal centers than was normally seen. The height of the reaction, judging from the blood pictures and the condition of the spleen and lymph nodes, was reached about the seventh day after the exposure to the heat. The degree of immunity to the transplanted cancer seemed to vary directly with the amount of stimulation of the lymphocytes present at the time of the inoculation or immediately following it.

The resistance shown when the cancer inoculation was made at the height of the moderately stimulating effect following exposure to the X-rays was much less than that noted when the inoculation was made at the height of the heat effect when the degree of stimulation was much greater. When the lymphocytosis set in after the tumor graft was established only a slight effect was noted.

All of these results together were taken by the authors to indicate that the degree of immunity was dependent on the amount of lymphoid stimulation present either at the time of the cancer inoculation or soon after it. G. E. BEILBY, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Tucker, J.: The Use of an Agar-Agar Solution in Gastro-Intestinal Roentgen-Ray Work. *J. Am. M. Ass.*, 1921, lxxvi, 1078.

The author has found that a 0.4 per cent agar-agar solution is preferable as a suspension medium for the insoluble barium or bismuth salts used in gastro-intestinal roentgen-ray work to the commonly used buttermilk. It is easily prepared, stable, suspends the salts well, causes no gastric symptoms after ingestion, is cheap, and gives clear shadows on the fluoroscopic screen and roentgen plate.

ADOLPH HARTUNG, M. D.

Petersen, W. F., and Saelhof, C. C.: Selective Organ Stimulation by the X-Rays: Enzyme Mobilization. *Am. J. Roentgenol.*, 1921, n. s., viii, 175.

With a view to determining (1) whether an alteration in the titer of serum enzymes occurs after roentgen radiation or similar stimulation, (2) whether variations in the serum enzymes take place when different organs are stimulated, and (3) the influence of different degrees of stimulation on the alterations in titer, the authors conducted a number of experiments on dogs. In their preliminary experiments they used large doses of roentgen rays without filtering for periods ranging from fifteen minutes to one hour. With the shorter periods of exposure they found that raying of the liver and intestinal areas resulted in some mobilization of enzymes, but that following the longer periods the titer of the enzymes diminished. They then proceeded with a 4 mm. filter of aluminum and reduced the time of exposure to five minutes, ten minutes, and twenty minutes. In the twenty-minute periods the raying was done also without a filter. Following such raying considerable alterations in the serum enzymes could be determined, depending on the area rayed and the duration of the exposure.

The studies on the dogs included determinations of the nitrogen secretion, the non-coagulable nitrogen of the serum, the leucocyte and differential count, the coagulation time of the blood, the titer of the serum protease, peptidase, esterase (lipase), diastase, the anti-trypsin, and the complement titer. With regard to nitrogen excretion the authors found that, with the exception of the periods following the longest exposures of the liver, there was no apparent increase following the roentgen-ray periods in the course of the experiments. The non-coagulable nitrogen of the serum was altered to a considerable extent only following raying of the liver area, when an increase of as much as 50 per cent was occasionally determined after raying for ten minutes or more. This increase persisted for several days.

Relative to the leucocyte count it was observed that following the raying of the liver a leucocytosis of transient nature resulted and that following raying of the intestinal area there was a step-like increase until a relatively high leucocytosis (15,000)

was maintained. The commonly observed leucopenia which follows raying in the human subject was not observed in these animals with the doses employed. The differential count following the raying of the hepatic area showed a well-marked eosinophilia in three of four dogs. Raying of the intestinal area and the splenic area resulted in general in a diminution of the mononuclear elements and a relative increase in the polymorphonuclear cell forms. The blood coagulation time was usually reduced from one to two minutes immediately following the raying. There seemed very little difference whether the splenic or hepatic or intestinal area was rayed, the result being apparent whatever region was stimulated.

As regards the serum enzymes it was found that raying the hepatic area increased the serum proteases after the ten-minute exposure. The long exposure when unscreened was no longer effective. Protease appeared also in the serum after raying of the intestinal area, while raying of the spleen seemed in general to be followed by a diminution of the originally high titer. After raying of the liver, peptidase made its appearance but never to the extent observed after raying of the intestinal area. Raying of the splenic area was never followed by such mobilization. Moderate doses of the roentgen rays seemed to mobilize the lipase after raying of the hepatic as well as the intestinal area; raying of the splenic area, on the other hand, seemed to cause a gradual reduction in the amount of lipase in the serum. The diastase curve usually took a short sharp rise following raying of the spleen. Raying of the intestinal area did not influence the titer as a rule but raying of the splenic area was followed by a diminution. The complement titer seemed unaffected by the rays in the dosage employed. Fluctuations in the titer of the serum anti-ferment were very marked. Usually the titer increased for a short time following the exposure, then diminished, and finally increased again gradually for from forty-eight to seventy-two hours. The most marked effect followed the more intense periods of exposure.

While the clinical development of the roentgen ray and the related radiant agents has been confined largely to the field of diagnosis and local therapeutics, the possibility of a remote therapeutic effect produced by the action on serum enzymes is a factor which must be taken into consideration. The regional stimulation of the abdominal organs reported in this paper may perhaps be of some significance in the study of the intoxications brought about by the roentgen rays and similar agents. If pathologic lesions are influenced by the serum enzymes it seems possible to the authors that through the stimulation of organs by the X-ray or some other related agent a means of obtaining such therapeutic control is offered. At the present time it is impossible to state definitely whether or not the metabolism of the normal cell is altered by the alteration in titer of serum enzymes, but where

necrotic tissue is dealt with the assumption seems plausible that an increase of the proteolytic serum enzymes would hasten the removal of such material provided other factors influencing digestion are favorable. Therefore such enzyme mobilization should be borne in mind in a study of the remote effects of radiant agents, not only when toxic manifestations are dealt with, but also when favorable therapeutic influences are made manifest.

ADOLPH HARTUNG, M.D.

Lawrence, W. S.: Remarks on the Technique of the Roentgen Examination of the Kidneys. *Am. J. Roentgenol.*, 1921, n. s. viii, 115.

In kidney work the chief aim should be to produce plates showing the whole kidney outline distinctly and without the aid of the imagination. Only such plates will possess the maximum diagnostic value. If the kidney substance shows clearly, denser substances will show much more clearly. To make distinct plates with uniformity and certainty certain points of technique are absolutely essential.

Of first importance is the quality of the ray used. The best results are obtained with a tube backing up a 3 to 3½ in. spark, passing 35 milliamperes from 4 to 8 seconds, depending upon the size of the patient. Second in importance is correct compression. A compression cylinder having a diameter of not more than 5 in. at a distance of 13 in. from the target and equipped with a convex aluminum cup should be pressed in as high up and as far laterally as possible under the costal arch, as much pressure being made as the patient can stand.

As regards preparation of the patient, Lawrence states that in the absence of constipation and gas formation in the colon the examination may be made successfully without previous preparation, but that preparation is best in every case when circumstances permit. This should consist of the administration of a thorough laxative the night before the examination and an enema given as nearly as convenient immediately preceding it.

The fourth essential for good plates is absolute control of the patient's respiration as even a slight respiratory movement is apt to obliterate the desired detail.

If the technique described is accurately carried out, the kidney outline will be revealed in every case, whether the patient is large or small, fat or lean. The best subject, however, is the rather fat, small person who has ample perinephritic fat to give the desired contrast. ADOLPH HARTUNG, M.D.

Bordier, H.: The Dangers of Radium (Les dangers du radium). *Presse méd.*, Par., 1921, xxix, 413.

According to a recent article by Mottram of the London Radium Institute, prolonged exposure to radium is more dangerous than prolonged exposure to the roentgen rays. The danger is the greater because it is not manifested by an external lesion. It is the blood-forming organs which are affected,

and if the condition is not observed in time death may result from pernicious anæmia.

Bordier gives the details of three cases, those of a nurse and two laboratory assistants at the London Institute who succumbed to pernicious anæmia which he believes was caused undoubtedly by radium rays. The anæmia in all three cases was characterized by a decrease in the number of red cells, polynuclear leucopænia, and absolutely no signs of regeneration. It resembled an anæmia produced by toxic gases such as nitrotohuol.

In examining the blood of a number of laboratory assistants Bordier found that it showed fewer red cells than the blood of other persons living in the same building but not exposed to the rays. He also performed some experiments on rats, keeping them for periods varying from twelve to four hundred and sixty hours in a cage with two pieces of radium bromide of 80 mg. each covered with 2.25 mm. of lead. The animals were killed after varying periods and the marrow of the femur was examined. After forty-eight hours there was a difference in the bone marrow between the irradiated animals and the control animals. The longer the exposure to the rays the greater the decrease in the number of mitoses.

These experiments and clinical cases show that the very penetrating rays of radium have a destructive action on the bone marrow and other blood-producing organs which is not possessed by the roentgen rays or the beta rays of radium. Bordier points out, however, that the new X-ray tubes have increasingly greater penetrating action and that as the intensity of these rays increases roentgenologists may be exposed to the same danger as those who work with radium. AUDREY G. MORGAN, M.D.

Klose, H.: The Surgical Complications of War Epidemics Other Than Influenza (Die chirurgischen Komplikationen der Kriegsseuchen mit Ausschluss der Grippe). *Ergebn. d. Chir. u. Orthop.*, 1921, xiii, 1.

The author discusses the surgical complications of typhoid, Paratyphoid A and B, and dysentery together. Inflammation of the lymphatic structures of the lower ileum often leads to purulent peritonitis and intestinal hæmorrhage. Operation is generally not indicated by hæmorrhage as it is too difficult to find the site of the bleeding. In cases of perforation the earlier operation is performed the better the results. Typhoid and dysentery are both frequently accompanied by appendicitis. Several cases are reported in which operation was successful.

In extensive necrosis and gangrene of the intestine due to dysentery surgical treatment is hopeless. Intestinal paralysis often occurs in the course of this disease. The author performed enterostomy in four such cases but saved only one patient. Not all cases of chronic dysentery are suitable for surgical treatment but in properly selected cases opening and emptying the intestine and intestinal irrigation have good results. The author prefers Witzel's oblique

cæcal fistula as it is not possible to empty the intestine satisfactorily through an appendicostomy, and if a cæcal anus is made it may be necessary to keep it open permanently as the ulcerated large intestine does not always resume its function. No part of the large intestine should be totally excluded as this leads to collapse; the ulcerated walls adhere to each other and the intestinal lumen is closed.

The after-treatment by intestinal irrigation is very tedious and must be kept up for months. If recurrence is to be avoided the fistula must not be closed until there is absence of mucus, blood, and pus in the stools, the patient is able to digest a full diet, rectoscopic examination shows that the mucous membrane is normal, the roentgen examination shows normal motility, and the patient has been free from recurrence for at least three months after the intestinal irrigation has been stopped.

The inflammatory circumscribed tumors of the large intestine which appear often after dysentery and more rarely after typhoid should be resected, and hæmorrhoids, prolapse of the rectum, and volvulus, which often follow dysentery, should be treated on the usual surgical principles.

Typhoid bacteria frequently settle in the gall-bladder, the lymphatic tissues, the mesenteric glands, the spleen, and the bone marrow, and only slight trauma is necessary to arouse them to renewed virulence. In suppurative typhoid thrombophlebitis resection of the diseased veins is indicated. Suppurations caused by the bacteria in any part of the body should be drained. Typhoid spondylitis frequently involves several vertebrae but rarely causes curvature. Persons with this condition should wear a plaster corset for several months. Typhoid bacilli rarely cause joint inflammations. In the cases of typhoid carriers the author recommends cholecystectomy. The prognosis in typhoid suppuration of the liver is poor if the abscesses are multiple but in cases of single abscess the mortality is only 17 per cent. The prognosis in typhoid abscess of the spleen is good.

The most frequent complication of typhus fever is gangrene of the extremities. Operation is necessary. Secondary infections and processes in the larynx, middle ear, mesenteric lymph glands, and kidney capsule must be treated surgically.

Malaria is frequently followed by splenic abscesses. These should be treated surgically. Cirrhosis of the liver with ascites is also a common sequela. Good results are obtained from Talma's operation combined with internal treatment for malaria. In all surgical operations on patients who have suffered with malaria the possible awakening of a latent malaria must be taken into consideration. A wandering spleen should be removed. Splenectomy is indicated also in cases of rupture of a malarial spleen. In simple malarial splenomegaly medical and roentgen treatment is preferable.

In smallpox, phlegmonous or gangrenous processes or suppurations, especially in the testicles, joints, and spleen, may demand surgical treatment.

In scorbutus, in addition to the changes in the gums and torpid furuncles, there may be hæmorrhagic effusions in the joints, the muscles, and beneath the periosteum which demand surgical treatment.

COLLEY (Z).

Stephens, R.: Osteomyelitis Following War Injuries. *J. Orthop. Surg.*, 1921, iii, 138.

The treatment of osteomyelitis following war injuries varied at the different hospitals, both in France and in the United States, and therefore some of the cases were treated by several methods as they were sent from one hospital to another.

Of a series of 174 patients with war injuries who were examined, 61 (35 per cent) had chronic osteomyelitis. In 7, the condition was due to other causes than gunshot wounds. In the remaining 54 it was the result of injuries inflicted by bullets, shrapnel balls, or explosive shells from ten to twenty-one months previously. It had been quiescent for periods varying up to one year; 49 cases had been closed less than six months.

The presence of through-and-through tunnels, cavities, or simple fistulae probably depended on the extent of the injury and the early treatment.

In 6 cases the superficial scar was broken down very easily by mild trauma or a low-grade infection, but bone disease could not be demonstrated. In 2 cases, a periosteoma, a definite fungus-like growth from the periosteal surface of the femur, was noted. One followed infection after a plating operation on a simple fracture, and the other was an osteomyelitis due to a severe contusion. Rocher states that very complete removal is necessary for its cure.

In 4 cases which showed the presence of a trough the roentgen ray demonstrated that radical bone operations had been done and the cavities were well obliterated. From 1 of these a sequestrum was removed. There were 2 cases of non-union in fractures of the ulna due to disease.

Seven cases showed the presence of shell fragments, but in only 2 did they seem to prolong the healing of the lesion.

Sequestra were present in approximately half of the cases and in variable locations. Of 10 amputation stumps 5 showed spur formation but this apparently has no relation to bone disease.

The aims in the treatment of compound fractures and bone wounds at the time of injury were as follows: (1) the removal of foreign bodies and free and mobile bone fragments, (2) the obliteration of dead spaces, (3) the prevention or removal of infection, and (4) efficient reduction, splinting, etc. as indicated. If all of these aims had been achieved most of the cases we see today could have been prevented. Many of the cases, however, were treated under circumstances far from ideal.

In the later stages of chronic osteomyelitis the object of treatment is somewhat the same, namely, the removal of remaining foreign bodies, sequestra, and infection, and the obliteration of cavities, tunnels, and fistulae.

In chronic cases the condition is more difficult to overcome as usually there is extensive osteosclerosis. Dehelly and Loewy emphasize the importance of obliterating the cavities during the period of early treatment or acute infection.

With the assistance of the X-ray all free and mobile adherent fragments and detached periosteum should be removed judiciously.

In chronic osteomyelitis of idiopathic or traumatic origin the infection is more apt to spread because it has no outlet. Chutro considers the fistula type superficial because of the presence of an outlet and a so-called lymphatic blockade. Others believe it is often very deep.

Dense osteosclerotic bone about a cavity forms a protective wall against infection and should not be removed except when a good blood supply is necessary for new bone production. To obliterate a tract or cavity the edges and underlying bone should be removed and the defect converted into a saucer-like shallow depression. If a tunnel is present the weakest or the most accessible wall may usually be removed. Bone defects may be filled in by forcing wedges of bone into them with some pressure, by free tissue transplantation, and by the use of pedicled flaps of fat or muscle.

In the author's experience the fat flap has failed in every instance but the muscle flap has been very successful. Other methods described are: crushing down the remainder of the involucrum to fill the cavity after removal of the sequestrum and the weekly application of 3½ per cent tincture of iodine; allowing the soft parts to fall in; firm packing of the wound; and the use of skin flaps, the sterile blood-clot, Soresi's method of trephining, and the polyvalent serum of Leclainche and Vallee. The results of these procedures have been variable.

The use of various antiseptics has been unsatisfactory because when they are of sufficient concentration they cause tissue necrosis and probably the formation of new sequestra.

Paste, wax, and similar materials have been tried extensively and some surgeons have obtained excellent results with them. The author considers their use limited as they may act merely as foreign bodies. Artificial light and sunlight have been employed undoubtedly with great benefit.

Subperiosteal resection may be indicated occasionally in the upper extremities where length is not so important as in the lower extremities. The best results are obtained in the young as in children bone evolution is still incomplete. In adults bone grafting is usually necessary.

Bone disease in amputation stumps may be cured by the removal of a foreign body or sequestrum and curettage, but occasionally re-amputation is beneficial if the shortening of the stump will not affect the application of a satisfactory prosthesis. In other cases re-amputation is absolutely necessary.

All of the author's cases were treated with extreme conservatism. In some instances incision and drainage of an acute flare-up and the removal of a

foreign body or sequestrum were sufficient. When a tunnel or cavity was present the sequestrum was removed, the cavity obliterated, and the wound left wide open for treatment by the Carrel-Dakin method. Stephens had no occasion to use pedicled flaps.

The last examination showed that in 40 cases the wound was closed, in 8 cases which were not operated upon the condition remained the same, and 6 cases apparently needed further treatment. The remaining 7 were operated on only recently.

Of the 6 patients requiring further treatment 3 had been subjected to extensive operations which had no effect upon the condition. In 1 of these cases a definite sequestrum was found, and in another, a shell fragment. A third showed an extension of necrosis. In the fourth a sequestrum was present which apparently was not found at operation. The fifth showed a periosteoma recurrence, and the sixth a new sequestrum.

Physiotherapy has been employed whenever possible and has undoubtedly shortened the period of disability in most cases by maintaining muscle tone and preventing loss of function. In some instances it has even improved the function of neighboring joints.

Occupational therapy and recreation have kept these ex-service men busy, happy, and satisfied, and have been of a great value in the treatment.

R. S. REICH, M.D.

LEGAL MEDICINE

When Entitled to Medical and Hospital Aid.

Chicago-Sandoval Coal Co. vs. Industrial Commission et al. (Ill.), 128 N. E. R., p. 567.

An employee of a coal company strained himself while attempting to lift a coal car which had left the track. He continued to work until it became necessary for him to go to a hospital and submit to an operation. The company contended that it was not liable for the medical, surgical, and hospital services because they were not rendered or requested within eight weeks of the date of the injury.

The Compensation Act of Illinois provides that the employer shall provide necessary first-aid medical, surgical, and hospital services, and also medical, surgical, and hospital services for a period not longer than eight weeks and not exceeding \$200. The employee, however, may secure his own physician, surgeon, or hospital services at his own expense if he so desires.

It is evident from these provisions that the legislature intended that the medical, surgical, and hospital services for which the employer is liable must be necessitated by the injury, but that such liability should not be limited to the eight weeks immediately following the injury if the necessity for such services does not arise immediately following the injury. The Industrial Commission, therefore, did not err in awarding in this case \$200 for medical, surgical, and hospital services.

J. A. CASTAGNINO.

Malpractice Not Shown in Compound Fracture Case. *Connelly vs. Cone et al. (Mo.), 224 S. W. R., p. 1011.*

Three physicians were charged with malpractice in reducing and treating a compound fracture of one of the plaintiff's legs which he sustained by being thrown out of a buggy. The evidence showed that he fell so that the bones of the leg protruded through the flesh, his clothing, and a rubber boot, and stuck into the ground; that he had to be taken ten or twelve miles for treatment; that it was at least two hours before treatment could be obtained; and that while on the ground he and the man who assisted him into the buggy straightened out the broken leg, pulling the bone back into the flesh. Necessarily a certain amount of dirt was pulled into the flesh and several fragments of loose bone remained in the leg.

No witness testified that the treatment of the injury by the defendants was done in a negligent or unskillful manner. Negligence could be claimed only on the basis of the result of the injury and its treatment. The principal fact relied on in this respect was that thirty days after the physicians had begun to treat the case, when a serious infection had been set up and pus was being emitted from the wound, a fragment of leaf the size of the thumb nail and small slivers of bone were discharged from time to time. About sixty to sixty-five days after the injury the defendants told the plaintiff that his leg should be rebroken and set properly, but he stated that he was not strong enough to stand this operation.

The court concluded that there was failure of proof to show that the plaintiff's misfortune was added to by negligence or unskillfulness on the part of his physicians.

J. A. CASTAGNINO.

Knowledge Not Intended to be Confidential. *In re Swartz's Will (Okla.), 192 Pac. R., p. 203.*

A patient should be encouraged to give the attending physician full and complete information as to his physical infirmities in order that the latter may be placed in a better position to give intelligent treatment. A patient is encouraged to speak freely to his physician by the fact that his statements are held in strict confidence and safeguarded by statute.

The physician in this case was called early in the morning of the day when the patient's will was made, the day before her death. He informed her that her condition was serious and that there was no hope for her recovery. The court did not consider it an error to permit the physician to testify in contested proceedings for the probate of the will since all that he testified to was that the patient was suffering with jaundice and this information was not obtained by reason of his knowledge as a physician, but rather by reason of knowledge possessed equally by the laity. Other persons in the room knew just as well as the physician that the testatrix was suffering with that condition.

If the physician and the patient had been alone and if it appeared that what was said by the patient

was intended to be confidential, or if the physician found it necessary to examine the person of the patient, there would be some reason for claiming that the veil of secrecy should be thrown over these communications and discoveries. Under the circumstances, what was said was not intended to be confidential as third persons were present and heard the entire conversation between the patient and the physician. Therefore the statutory provision was not applicable.

J. A. CASTAGNINO.

Validity of Contract for Services. *Buller vs. Oldham (Ark.), 224 S. W. R., p. 985.*

Dr. Abbott became seriously ill with pneumonia and was removed to a hospital, where he remained until the date of his death under the constant care of nurses and two physicians. The plaintiff and Dr. Abbott were personal friends. During the afternoon of the day before Dr. Abbott died one of the nurses at the hospital telephoned to the plaintiff, stating that Dr. Abbott asked him to come to see him. After finishing his professional calls for the day the plaintiff went to the hospital where Dr. Abbott was, arriving at about 11 o'clock at night. He went immediately to see Dr. Abbott and then remained with him until he died the next morning at about 7 o'clock.

After the plaintiff reached the bedside of Dr. Abbott, the latter drew a check for \$1,000 payable to the plaintiff and gave it to a man who accompanied the plaintiff, with instructions to deliver the check to the plaintiff as compensation for his services in attending him from then until his death, or for a period of ten days if he lived that long.

On the trial of the case the plaintiff adduced testimony tending to show that after he reached the bedside of Dr. Abbott and had talked with him to a considerable extent, he was about to return to his home when Dr. Abbott requested him to remain there in attendance, and it was agreed that he should receive \$1,000 for his services. Other testimony tended to show that at that time Dr. Abbott was not mentally capable of transacting business. An attending physician testified that Dr. Abbott was unconscious most of the week preceding his death, but had lucid intervals. One of the nurses testified that he had a high fever and was frequently irrational and that from about 5 o'clock of the evening before his death it was apparent that the end was very near.

Other evidence in the case and circumstances warranted the conclusion that Dr. Abbott was not of sufficient mental capacity on the night before his death to enter into any business transaction. This being true, there was no express contract between the plaintiff and Dr. Abbott for compensation for the services of the former, and the plaintiff could recover only the reasonable value of his services. The trial court found the value of these services to be \$150 and allowed a claim to that extent. The Supreme Court denied a rehearing.

J. A. CASTAGNINO.

Payment under Contract with Employer May Exceed Amount in Compensation Act. *Collins vs. Joyce et al., Minnesota Supreme Court, 178 N. W. R., p. 503.*

The defendants and Boltz, their employee, were both within the jurisdiction of the Minnesota Workmen's Compensation Act which made it the defendants' duty to provide Boltz with medical and surgical supplies up to \$100. The defendants contended that a contract to pay more than that amount should not be implied by a request made by them to the plaintiff, a physician, to attend Boltz and that a judgment for more than the amount fixed by the Act could not be sustained on the grounds of an express contract.

The Minnesota Supreme Court concluded that there was no good reason why the defendants might not agree to furnish medical and hospital attention and supplies to their employee in excess of their statutory obligation if they saw fit to do so, and no reason why they might not obligate themselves to pay the plaintiff the full value of such services furnished to their employee at their request. The plaintiff testified that he was called by Rasmussen, one of the defendants, and that while they were on their way to attend Boltz, the plaintiff asked, "What about my pay?" and that Rasmussen replied: "We carry insurance; we get our money from the insurance company and then we pay you. You don't need to worry about that." The fact probably was that neither party thought or knew of the limitation of the Compensation Act.

The court thought the jury might construe the language used as a contract to pay the value of the services the plaintiff should render to Boltz. The plaintiff was permitted to say that he performed

his services on the credit of the defendants rather than on that of Boltz. This was held proper. The defendants, however, offered proof tending to show that he gave credit to Boltz. Verdict for the plaintiff was affirmed.

J. A. CASTAGNINO.

Death from Septicæmia through the Gum After Extraction of Tooth Not Accidental. *Ramsey vs. Fidelity & Casualty Co., Tennessee Supreme Court, 223 S. W. R., p. 841.*

Death from injury to the gum caused by the extraction of a tooth which made a portal of entry for bacteria into the circulatory system and resulted in septicæmia was held not within a policy insuring against "bodily injury through accidental means exclusive of all other causes." The inevitable result of the extraction of a tooth would be the breaking down and laceration of the gum tissue. Only the septicæmia which followed the pulling of the tooth and the laceration of the gum tissue was unexpected.

J. A. CASTAGNINO.

Right of Child to Damages for Prenatal Injuries. *Drobner vs. Peters (N. Y.), 184 N. Y. Supp., p. 337.*

A child, injured for life through the negligence of the defendant before it was born, may recover damages for the injuries thus received. The common law is sufficiently elastic to fit itself to new conditions and to progress with advancing civilization and our ever-growing humanitarianism. It is therefore but a manifestation of this spirit of the law to recognize the responsibility of the defendant to this child doomed to go through life permanently injured in head, body, and limbs.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Huntington, J. L.: Acute Inversion of the Uterus.
Boston M. & S. J., 1921, clxxxiv, 376.

After giving a brief historical sketch of acute inversion of the uterus, the author reports two very interesting cases of his own. One of these patients made an excellent recovery after a laparotomy and reduction of the inverted fundus of the uterus by taxis. The other died of sepsis sixteen days after several unsuccessful attempts, under ether, to effect reduction through the vagina which were followed by abdominal hysterectomy. The conclusions drawn are as follows:

1. Acute inversion of the uterus postpartum may occur spontaneously.
2. Insertion of the placenta in or near the fundus of the uterus seems the most probable etiological factor.
3. As the fundus, weakened by being the placental site, may be encountered, great care is necessary in expressing the placenta by pressure from above.
4. Shock, whether or not accompanied by postpartum bleeding, demands immediate vaginal examination unless the typical spherical fundus can be felt distinctly through the abdominal wall.
5. When the diagnosis is made too late for manual reposition from below, immediate laparotomy and reposition by traction followed by direct transfusion offer the best chance for a successful outcome.

HARVEY B. MATTHEWS, M.D.

Peffer, J.: The Results of Interposition of the Uterus in Prolapse (Die Erfolge der Interposition uteri bei Prolapsen). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1921, liv, 236.

Watkins first performed interposition in 1898, but Wertheim first published the method in 1899. Four weeks later it was described by Schauta. The original technique proposed by Wertheim and Schauta is no longer used as the morbidity and mortality were high. Since the introduction of suspension and symphysiopexy the results have been much better. The mortality, which at first was between 6 and 7 per cent, has now been reduced to 2 per cent or less. A cure is obtained in over 90 per cent of the cases. Cramer gives the mortality as 1.2 per cent and the percentage of permanent cures as 96.5 per cent. The corresponding figures given by von Franqué are 1.5 and 95.3 per cent, and those given by Wertheim, 0.85 and 97.5 per cent. Fuchs states that his permanent cures amount to 97.3 per cent, and Violet, Braecker and Ticknadse claim that they obtain a permanent cure in every case.

In the author's clinic 95 cases were treated by this method from 1915 to 1920. Four were cases of recurrence after other operations. Peffer divides these cases into prolapse of the first, second, and third degrees. In those of the first degree the genital opening when contracted admits one or two fingers, while in those of the second degree it admits two or three fingers, and in those of the third degree a greater number may be inserted. Fifteen per cent of the cases were of the first degree; 40 per cent, of the second; and 45 per cent, of the third. The mortality was 2 per cent. Two patients died of septicæmia and bronchopneumonia. There was total recurrence in one case (1.2 per cent), partial recurrence in 6.4 per cent, and a permanent cure in 92.4 per cent. The method of operation is briefly as follows:

A longitudinal incision is made from the urethra to the cervix, the edges of the incision are undermined, and the bladder is dissected free. If the patient has not reached the climacteric a tube sterilization is performed. The peritoneum of the bladder is sutured to the posterior wall of the uterus. A silk thread is then passed through the fundus near the insertion of each tube and fixed to the corresponding arcuate ligament. The superfluous flaps of vagina are resected and the edges sutured over the uterus, the latter being caught with each stitch so as to prevent the formation of niches which would favor the development of bacteria. A perineorrhaphy is done in every case. Careful hæmostasis is necessary throughout the operation.

The subjective results were excellent in all cases. Recovery was uneventful. There were no cases of hæmorrhage, suppuration, or cystopyelitis. In Peffer's opinion a permanent cure may be obtained by a careful technique in every case. He compares interposition of the uterus with other operative procedures. The chief methods in use now are the Dührssen-Mackenrod vaginal fixation and the Alexander-Adams operation. Doederlein in reporting 1,000 cases gives the percentage of cures obtained by these plastic methods as 70 per cent. Of the 30 per cent of recurrences, 5 per cent were severe recurrences. Fueth recently reported 74.1 per cent of cures. The permanent recoveries following the interposition operation average between 92.5 and 93 per cent and the recurrences only 1 or 2 per cent. A further advantage of the latter method is that it allows coition. Peffer concludes that in prolapse of the first degree interposition should be supplemented by perineorrhaphy. In prolapse of the second degree in young women who desire children it is contra-indicated, but in all other cases—those of young women who do not desire children,

women who have passed the menopause, and cases of prolapse of the third degree—it is the operation of choice.

A. G. MORGAN, M.D.

Gutiérrez, A.: Hæmatometra and Appendicitis (Hematometra y apendicitis). *Semana méd.*, 1921, xxviii, 308.

A girl, aged 13 years, who had not yet menstruated, was operated upon for appendicitis. When the abdomen was opened a round mass which suggested the uterus was seen. The cæcum and appendix were strongly adherent to the right tube. The appendix, which was greatly congested, was removed. Aspiration of the uterus withdrew colored fluid which resembled menstrual blood. The upper part of the vagina showed atresia. The menstrual blood had been retained in the uterus and the upper part of the vagina. The reason the symptoms were not more marked was probably that the onset of menstruation was very recent and the blood retention not sufficient to cause uterine colic.

Cases of appendicitis have been reported in which the first crisis began in puberty before or during the first menstruation. In these cases the appendix was very large, protuberant, in a low pelvic situation, and near the right adnexa or united to them by some inflammatory process. One author described a serous membrane which, beginning in the upper external part of the right broad ligament, sometimes becomes fixed posteriorly in the meso-appendix. By uniting the appendix and the right adnexa this membrane forms a route by which an infectious process may spread.

W. A. BRENNAN.

Solomons, B.: Some Remarks on the Danger of the X-Rays in the Treatment of Fibroids of the Uterus. *Med. Press*, 1921, n. s. cxl, 273.

Although the use of roentgen therapy for fibroids of the uterus has proved itself of value both by reducing the tumor and controlling the hæmorrhage, it has certain disadvantages. Aside from the expense and time required for the satisfactory carrying out of the treatment, the danger of malignant degeneration associated with the fibroid condition must always be considered. A case in point seen by the author is cited in detail, and another one reported by Martindale adds evidence of the danger.

The inhibition of ovarian secretion which is invariably associated with roentgen treatment of fibroids is also a factor of importance. The train of symptoms which this brings on is not produced if a hysterectomy is performed and both ovaries are left.

ADOLPH HARTUNG, M.D.

Dartigues, L.: The Operative Technique of Fibromyomectomy by Conservative Cervical Hysterotomy, Unilateral or Bilateral (Technique opératoire de la fibromyomectomie par hystérotomie cervicale conservatrice uni- ou bicommissurale). *Rev. franç. de gynéc. et d'obst.*, 1921, iii, 1.

Many fibromyomata of the uterus can be removed by the conservative vaginal operation without the

destruction or removal of any part of the uterus. The uterus is drawn down to the vulva and an incision extending up to the isthmus is made in one side of the cervix. In some cases this incision exposes the tumor sufficiently for its removal but if it does not it may be extended. Both sides may be incised and if necessary the incision may be carried up into the body of the uterus. The tumor may then be removed as a whole or in fragments. When it is large, a cone of tissue may be removed by means of a knife passed down to the tip of a corkscrew. In some cases after it has been reduced in size in this manner the rest can be removed as a whole with the scissors or a knife, but often it is necessary to remove the entire growth bit by bit. Great care and skill are essential in this part of the operation to avoid perforating the wall of the uterus. To the experienced operator, however, the feel of the tumor tissue is quite different from that of the uterine wall.

After the removal of the tumor the cavity left in the uterine wall should be carefully cleansed with sponges; it is not well to irrigate as fluid might pass through the thinned wall or some unsuspected fissure into the peritoneum. Compresses wet with hydrogen peroxide may be used. The uterus should then be tamponed before it is sutured. The gauze used should not have ravelled edges. Great care must be taken to pack the cavity so that no dead space is left. Chromicized catgut is the best suture material as it is not absorbed too quickly. The final step is the tamponing of the vagina.

The article contains numerous illustrations showing the steps of the operation and the special instruments employed by the author.

A. G. MORGAN, M.D.

Hornung, R.: The Operative Treatment of Myoma (Unsere Erfahrungen der operativen Myombehandlung). *Zentralbl. f. Gynaek.*, 1921, xlv, 381.

The author reports the results of 447 operations for myoma, 25 per cent of which were performed on nulliparæ. The chief symptoms were pain and hæmorrhage. In some cases there were urinary symptoms consisting of a feeling of pressure on the bladder or of traction on its neck. In 47 cases there were complicating tumors of the adnexa; in 31, cystomata; in 2, adenocarcinoma of both ovaries. Sarcomatous degeneration was present in 9 cases (2 per cent). In 5 cases there was also carcinoma of the body of the uterus, and in 2 cases carcinoma of the cervix. If 2 cases of carcinoma of the uterus which were complicated by myoma are included, carcinoma was associated with myoma in 2 per cent of the total number.

Six patients were pregnant and in 2 cases there was tubal pregnancy. The total mortality was 8 deaths (1.79 per cent). This is the lowest percentage that has been reported in the literature to date. Embolism of the lung occurred on the fourth, ninth, and tenth days respectively in 3 cases which were progressing uneventfully up to

that time. One patient died of ileus, 1 of toxæmia, and 3 of sepsis. The adnexa on both sides were removed in 210 cases; on one side in 79 cases.

Lumbar anæsthesia was used in 73 vaginal and 55 abdominal operations. In 5 cases sacral anæsthesia was employed, and in 8, local anæsthesia. In the rest the anæsthesia was induced with ether. In the 6 cases complicated by pregnancy total extirpation was done. In 4 enucleations of the pregnant uterus abortion occurred in only 1. In 1 case an injured ureter was implanted in the bladder; uneventful recovery followed. In another case the ureter was badly bruised and was implanted prophylactically with equally good results.

In 9 cases recovery was complicated by respiratory disease; in 4, by cystitis; and in 4, by hæmatoma. In 3 cases there was an exudate around the stump, and in 1 case an exudate in the parametrium. Thrombosis occurred in 3 cases in which a vaginal operation was performed and in 11 cases in which an abdominal operation was done. There were 3 cases of lung infarct and 3 of fatal embolism. The fact that the number of cases of embolism following abdominal operations was three times as great as the number following vaginal operations indicates that the greater severity of the operation and the greater injury to the tissues plays a part in their causation.

Women who have bled a great deal should be operated on by the vaginal route if possible. The size of the tumor does not make a great deal of difference. More depends on its mobility and the possibility of bringing it down into the pelvis. Generally myomata as large as a man's head can be removed through the uterus. In the 175 vaginal operations Schuchard's incision was necessary in 29. Often, however, the abdominal method is preferable because of the difficulty in rendering the vagina aseptic. Pediculated tumors, of course, can be easily removed through the vagina.

The question of roentgen treatment is not yet settled. It has no direct mortality. It cannot be adapted to the individual case and cannot have any effect in cases of mistaken diagnosis or on complicating conditions, such as tumors of the adnexa. In fact, it is purely symptomatic.

The amenorrhœa obtained by roentgen treatment and the definite cure of a myoma are two very different things. Operation is still the preferable treatment and should be used in the majority of cases.

KULENKAMPPF (Z).

Weiss, E. A.: Borderline Carcinoma of the Cervix and Its Treatment. *Am. J. Obst. & Gynec.*, 1921, 1, 661.

Cancer of the cervix is still to be classed as an operable condition if it is discovered early and the patient is a good risk. When a doubtful borderline condition is presented, treatment with radium is advisable and the question of subsequent operation should be determined by the reaction obtained. If operation is contra-indicated by age, the general

condition, or the condition of the heart, kidney, or blood vessels, radium alone should be used.

A careful comparison between the cautery and radium type of treatment shows that both have advantages and disadvantages and that in carefully selected borderline cases far better results are obtained by a judicious combination of cautery amputation and moderate doses of radium.

The results in the series of 38 borderline cases reviewed, while generally satisfactory, are far from conclusive. The wide range of radium dosage in treating cervical cancer, varying from 1,500 milligram hours in some clinics to 8,000 milligram hours in others, shows that no definite conclusions have been reached. While favorable results from both extremes have been reported, the use of radium will be somewhat empirical. Definite conclusions can be drawn only after a careful tabulation of the end-results in a large series of cases.

E. L. CORNELL, M.D.

Ballerini, G.: Clinical and Operative Notes on Carcinoma of the Body of the Uterus (Note cliniche e operatorie sul carcinoma del corpo uterino). *Folia gynæc.*, 1920, xiii, 247.

The author reports 73 cases, most of which, because of war conditions, could not be followed up. From the statistics of Winter, Waldstein, Wertheim, and others and from his own experience he finds that about 14 per cent of uterine cancers are in the body of the uterus and the remainder in the cervix. In the majority of cases the neoplasm develops between the fortieth and sixtieth years of age.

Twenty per cent of the patients whose cases are reviewed were nulliparæ, and 24.6 per cent were women who had had one or two children. In many cases the condition appears in connection with a fibromyoma; the percentage varies in different statistics from 19 to 30 per cent; in the author's cases it was 19.1 per cent. Carcinoma of the body of the uterus is seldom associated with tumors of other organs. The author found it combined with cystocarcinoma in one case, and with cysts of the ovaries in two. Weibel found it associated five times with tumors of the ovaries and once with a tumor of the tube. A bicornate uterus was found in two of the author's cases. In the same series 30.2 per cent of the carcinomata developed during the menopause, while in Wertheim's cases the corresponding figure was 58.2 per cent.

The clinical picture is characterized by irregular hæmorrhages which frequently become continuous. There were cases of very advanced tumor, however, in which hæmorrhage had occurred only for a short time, and still operable cases in which hæmorrhage had persisted for years. Before the menopause the picture may be confused by an associated myoma or disease of the adnexa.

It is generally possible to operate as the tumors grow slowly and do not penetrate the uterus for a long time. Among 64 patients there were only 2

who were found to be inoperable after the abdomen was opened. In 7 cases vaginal operation was performed; in 47, total abdominal hysterectomy; in 4, subtotal hysterectomy; and in 4, Wertheim's operation.

Of the 7 patients upon whom a vaginal operation was performed 2 died, 1 was alive without recurrence after four years, and 5 were still living without recurrence after five years. Therefore, according to Winter's classification, the absolute cures amounted to 57.1 per cent and the long-continued cures to 80 per cent.

In the cases subjected to abdominal operations there was no preliminary treatment by cauterization, etc. When the anterior vault of the vagina was opened a sponge dampened with tincture of iodine was introduced and during the further course of the operation this was replaced by gauze strips. After the removal of the uterus only the lateral parts of the vagina were closed with a few sutures through the connective tissue; in the middle it was left open and drained and the peritoneum was closed over it. In Wertheim's operation the ureters, bladder, and vagina were freed from the surrounding tissues by blunt dissection.

The mortality of the various operations was as follows: subtotal hysterectomy, 0; Wertheim operation, 1 (25 per cent); total hysterectomy, 7 (14.5 per cent). Of the 4 patients operated upon by the Wertheim method 1 died after the operation, 1 died of a local recurrence a year later, and 1 was well after four years. The total mortality was therefore 35.7 per cent. In the cases of total hysterectomy later data are lacking. Late recurrences are rare; generally the recurrences are local and develop within the first year.

The author prefers the abdominal operation because it is the only method by which the entire organ may be removed with the parametrium, the adnexa, and the iliac and lumbar lymph glands.

FRANK (Z).

Siegel, P. W.: Life Expectancy of Women with Carcinoma of the Uterus (Die Lebensdauer der an Uteruscarcinom erkrankten Frau). *Strahlentherapie*, 1921, xii, 97.

This article is based on 179 cases of carcinoma of the uterus treated at the Giessen clinic. Those which were operable were operated upon and those which were inoperable were treated conservatively without radiotherapy. It was found that of the patients with non-operable carcinoma of the cervix, 13 per cent were alive five years after the beginning of treatment, while among the operative cases the primary mortality averaged 28 per cent and 23 per cent of the patients were alive five years after operation.

Though the more radical surgical methods, such as Wertheim's operation, gave a more favorable late result, the primary mortality was higher than that following the less radical procedures. Therefore the favorable late results were outweighed, especially

when we consider that the patients operated upon included a number who had beginning carcinoma of the cervix and whose life expectancy was therefore fairly good.

The number of patients still living five years after Wertheim's operation for cancer of the cervix was only 11 per cent greater than the number of those still alive five years after the use of conservative methods of treatment.

At the Kroenig clinic they compute the average life of the woman operated on for cancer of the cervix at one and a half years, and that of the woman not operated upon at one and three-fourths years. At the Giessen clinic the corresponding figures are two and three-fourths years and two and one-fourth years. Accordingly, in Kroenig's clinic there is no increase of life for the patients operated upon, while at the Giessen clinic a half year is gained.

In carcinoma of the body of the uterus radium treatment gives as good results as operation. Operation for carcinoma of the cervix and body has not shown the expected good results on account of the high primary mortality. However, if a woman survives the operation she has a chance of living longer and will be free of the carcinoma and therefore more comfortable. The essential factor in lengthening life in cases of carcinoma is the reduction of the high primary mortality; this can be accomplished by using less radical methods of operation in the early stages and by making greater use of radiotherapy followed by less radical operative measures.

SIMON (Z).

ADNEXAL AND PERI-UTERINE CONDITIONS

Schiffmann, J.: Sterilization by Ligation of the Tube (Zur Frage der Sterilisierung mittels Tubenligatur). *Zentralbl. f. Gynaek.*, 1921, xlv, 464.

After a short review of the literature and cases in which an operation for sterilization failed, the author reports four cases in which it was possible to extirpate the ligated parts and examine them microscopically. In animals it has not been possible to effect sterilization by ligating the tubes. The conditions are probably the same in man. There is a narrowing of the lumen of the tube but not complete atresia. The microscope shows cubical epithelium instead of mucosa, atrophy of the musculature at the point of ligation, many giant cells, and crowding of the vessels with red corpuscles. The technique of sterilization differs according to whether the operation is done with the uterus in position or whether it is done secondarily in interposition of the uterus. In the former case a part of the tube is resected and the stumps are carefully sunk between the leaves of the broad ligament. In the latter case the technique is simpler. A small piece of the tube is resected between two ligatures without covering it with peritoneum. The resected ends are then pulled further apart by the changed position of the uterus. A simple double ligation without resection in these cases is not sufficient. VORSCHUETZ (Z).

Huerzeler, O.: The Effect of Ovarian Secretion on the Amount of Sugar in the Blood (Beitrag zur Frage der Beeinflussung des Blutzuckers durch das Ovarium). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1921, liv, 215.

The effect of ovarian secretion on the metabolism of sugar has been a subject of experimental investigation for the past few years. Formerly the amount of sugar in the urine after the injection of adrenalin was regarded as a measure of ovarian function, but more recent work makes use of the variations in the blood sugar.

In experiments on rabbits the author found that after the injection of adrenalin the normal rabbit does not show any hyperglycemia but that after castration the same animal reacts to the same dose of adrenalin with a pronounced but temporary rise in the blood-sugar content. There is a marked accumulation of the sugar in the liver in the castrated animal caused by a stimulus which in the normal rabbit has no demonstrable effect. The body seems to adapt itself to the changed condition so that after a certain time the amounts return to normal. The manner in which the internal secretion of the ovary brings about this balance is not known.

AUDREY G. MORGAN, M.D.

Reel, P. J.: Krukenberg Tumor of the Ovary. *Ann. Surg.*, 1921, lxxiii, 481.

The author describes in detail the clinical history and findings in the case of a young woman with a solid tumor of each ovary. These tumors bore all the pathologic features of a "fibrosarcoma ovarii mucocellulare," a tumor first described by Krukenberg in 1896. The histogenesis of such growths is still doubtful, that is, it is not known whether they are primary or always secondary neoplasms. Reel's case is cited as a contribution to this interesting discussion.

His patient, who was 21 years of age, was admitted to the clinic with a diagnosis of "surgical abdomen." The onset of the pain was extremely sudden and severe and occurred while normal menstruation was in progress. The size of the abdomen had increased rapidly. On palpation a solid tumor was found on each side of the lower abdomen. At operation, considerable free fluid was discovered in the peritoneal cavity and a solid tumor was removed from each ovary with the corresponding tube. There was so much secondary involvement of the broad ligaments that removal of the uterus was impossible. Secondary nodules were found throughout the abdomen, with the exception of the liver, and it seemed probable that the primary growth was in the stomach. The patient died several months subsequent to the operation. Autopsy was not permitted.

Upon study, the tumor stroma was found to agree in arrangement with that of the growth known as the Krukenberg tumor. Connective tissue cells were distributed throughout this stroma which otherwise had the appearance of epithelium. In

certain portions these cells were distended with mucoid material. Throughout, they showed a decided tendency to arrange themselves in tubules, a characteristic feature of this new-growth.

The article is supplemented with a bibliography.
W. H. CARY, M.D.

Markley, P. L.: The Treatment of Inoperable Parovarian Cystadenoma by Laparotomy and Radium. *Illinois M. J.*, 1921, xxxix, 353.

The author reviews an article by Beck in which he describes his method of treating deep-seated carcinomatous masses which are considered inoperable. Since the most favorable results have been obtained with the X-ray and radium in cases of superficial carcinoma, Beck has treated deep-seated growths as an exposed superficial carcinoma by purposely removing overlying skin, fascia, and muscles and as much of the mass as is safe.

Markley reports a case of inoperable cystadenoma treated by laparotomy and radium. The patient had been operated on three years previously for parovarian cyst. This had recurred. The tumor filled the abdomen and from six to eight quarts of fluid were withdrawn by repeated drainage every five to eight days. The abdomen was opened and a large rubber drain introduced into the cyst. Fifty milligrams of radium were then inserted in the tube for forty-eight hours. Great improvement was noted for seven months but since then a mass in the ovary on the other side has become palpable.

I. E. BISHKOW, M.D.

EXTERNAL GENITALIA

Moskowitz, L.: Plastic Reconstruction of a Defective Vagina (Plastik bei Scheidendefekt). *Zentralbl. f. Gynaek.*, 1921, xlv, 80.

There have been many deaths after Baldwin's operation; therefore the author recommends his modification of Gersuny's method which he used first in 1908 and 1909.

In the case of a 23-year-old patient who had no vagina at all rectal examination showed that the rectum lay very near the bladder and urethra and could be pushed forward under the hymen. Moskowitz made a transverse incision in the hymen and at the ends of this incision two perpendicular lateral incisions, so that he had an H-shaped incision enclosing a short anterior and a longer posterior flap. After dissecting off the two flaps he incised the rectum, which was thus laid bare, and sutured the anterior edge of the rectal wound to the anterior vestibular flap.

On the anterior surface of the rectum he then made two longitudinal incisions 10 cm. long and connected them at the upper end by a transverse incision 3 cm. long to form a Gersuny flap. Holding this flap and the bladder forward, he mobilized the rectal mucous membrane by deepening the incisions and drawing downward with the forceps. He then made two series of sutures in the rectum, first a series of

catgut sutures on the rectal side, which did not include the rectal mucous membrane, and over these a series of button sutures of silk from the newly-formed vagina. The posterior vestibular flap was sutured to the suture line of the rectum. Between the end of the flap of mucous membrane and the vestibular flap forming the posterior vaginal wall only a small raw surface remained.

The second case was that of a 21-year-old girl. The operation was performed in two stages. From the posterior ends of the labia minora a transverse incision 3 cm. long was made on each side to the middle of the anterior circumference of the anus and carried down to the sphincter. The sphincter was incised in the midline. The rectal mucous membrane was seized with forceps at the level of the top of the pouch of Douglas and pulled down to the level of the anus, a transverse incision was made in the part drawn down, the posterior edge of the incision in the rectal mucous membrane was sutured to the edge of the incision in the anus, and the anterior edge of the wound was dissected forward and separated as far as possible from the posterior edge. The skin of the perineum on both sides was then sutured between the two flaps and the sphincter thus united.

Four weeks later an opening was made into the new vagina at the proper point. An incision was made at the site of the hymen, the skin of the perineum was undermined with a volsellum forceps to the opening of the newly formed vagina in front of the anus, and the newly formed vagina was dissected free, drawn through the tunnel just formed to the opening at the hymen, and fixed in place with sutures. A perineorrhaphy was then done between the vagina and rectum.

SIMON (Z).

Schubert, G.: Vaginal Reconstruction in Cases of Defective Vagina (Die Bildung der Scheide bei Vaginaldefekt). *Zentralbl. f. Gynaek.*, 1921, xlv, 229.

The author discusses the two methods of reconstructing the vagina. It may be replaced either by the rectum, the method which the author has followed for the past ten years and which he recommends, or by the small intestine. He gives a table showing the results with reference to the possibility of cohabitation. Among the 32 cases in which the ileum was used there were 4 deaths, 2 from peritonitis and 2 from gangrene of the ileum. In 1 case there was a poor functional result. Among the 33 cases in which the rectum was used there were no deaths and 1 poor functional result.

In the method of ileum transplantation the disadvantages are the great amount of secretion, the frequency of pain when the ileum is touched, and the possibility of hernia at the passage through the mesentery. Especially discrediting the method as compared with the procedure utilizing the rectum is the high mortality of 12 per cent. The disadvantage of the rectal method is the possibility of rectal incontinence but this can be overcome by a plastic operation with fascia. There is also the possibility of gangrene of the portion of intestine used, a

danger which can be avoided only by careful technique and practice in resection of the rectum. Too great stretching of the sphincter is apt to cause incontinence. The author places a tampon the size of a walnut in the rectum, and dissects the rectum out for a distance of 5 cm. from the anus. This method is not so severe as operating from the sacral incision. After the upper end of the rectum is pulled through the anus, the denuded area just above the sphincter is sutured with a few button-hole sutures to narrow the rectal lumen and relieve the sphincter as much as possible.

Schubert states that Bumm and Stockel also prefer the rectal method.

VORSCHUETZ (Z).

Formiggini, B.: Cysts of the Labia Minora (Contributo allo studio delle produzioni cistiche delle piccole labbra). *Policlin.*, Roma, 1921, xxviii, sez. prat., 509.

The author removed a cyst the size of a nut from the posterior part of the internal surface of the left labium minus of a woman 42 years of age. The microscopic examination showed that it could not have arisen from any of the elements normally contained in the labium. Formiggini therefore seeks its origin in an embryonic inclusion occurring in the period of formation of the genital organs. In this connection he discusses aberrant Bartholin glands, peri-urethral glands, Skene's ducts, and the muellerian and wolffian ducts.

He reaches the conclusion that cysts of the labia arise similarly to dermoid and mucoid cysts. In the first period of embryonic life, when the anal membrane is formed of undifferentiated ectodermal and endodermal laminae a portion of lamina or a group of primary endodermic cells may remain adherent to the ectoderm and become included in the structure which is destined ultimately to develop into the external genitals. These endodermic cells borne into an abnormal position preserve their embryonic structure and form a cellular type differentiated by its endodermal character. In the cyst in the author's case the epithelial lining preserved the embryonic aspect, showing a simple stratum of cylindro-cubical cells which at various points were ciliated.

W. A. BRENNAN.

MISCELLANEOUS

Titus, E. W.: An Analysis of 200 Gynecological Cases Treated with Radium at the Woman's Hospital in the State of New York. *Am. J. Obst. & Gynec.*, 1921, 1, 685.

The results obtained correspond to those of others. Two hundred and one patients have been treated in a period of eighteen months.

Ninety-five cases of carcinoma of the uterus were treated. In 86, the cervix was the site of the growth, and in 9, the fundus.

Of the patients with carcinoma of the cervix, 55 are living and free from symptoms. Twenty-four were treated less than six months ago; 24 others,

between six and twelve months ago; and 7, between twelve and eighteen months ago.

Thirty-one patients died. Sixteen died less than six months after the radiation, 9 between six and twelve months afterward, and 6 between twelve and eighteen months afterward. In 2 cases death resulted from distant metastases to the lung and to the liver respectively. Another death occurred from pneumonia, probably influenzal, two months after radiation. Sixty-four per cent of those complaining of pain have been relieved. In 3 per cent of those complaining of pain the pain was increased. Hæmorrhage and leucorrhœa have been checked in all but 2 cases. In 6 cases the hæmorrhage was decreased after four to six months.

Bladder and rectal irritation was sufficiently severe to demand treatment in only a few cases. Two fistulæ resulted, one vesicovaginal and one rectovaginal.

Seven patients who had advanced carcinoma are living and free from symptoms a year or more after radiation.

Of the patients with carcinoma of the fundus 4 were subjected to complete hysterectomy and were given pre-operative and postoperative radiation. All except 2 are clinically cured.

There were 5 cases of carcinoma of the vagina, 1 primary and 4 recurrent after hysterectomy. Two of these patients are living, 1 being cured after twelve months and 1 after six months. Three died, 1 two months, and 2 six months, after radiation.

The 2 patients with carcinoma of the vulva who were treated are both living. One was benefited but later showed extension. The other was treated too recently to warrant a statement regarding the outcome.

Three cases of carcinoma of the breast were treated with radium after radical removal. One patient died several months later of extension to the mediastinum. The others are free from recurrence after one year.

In cases of carcinoma of the urethra and bladder the results were not so good. Hæmaturia was relieved but the treatment had little effect on the lesion.

In the cases of carcinoma of the rectum improvement was noted in all. Four patients are living,

1 six months, and 3 over one year, after radiation. One died from the shock of resection of the sigmoid.

The non-malignant conditions treated included cases of uterine myoma, menorrhagia, metrorrhagia, and leucorrhœa.

There were 44 cases of uterine myoma. Fifteen of the patients were under, and twenty-nine over, 29 years of age. In all, the hæmorrhage was controlled and the tumor reduced in size. In 2 cases the tumor disappeared.

Thirty-nine of the cases of menorrhagia and metrorrhagia were those of patients less than 40 years old. The dosage of radium was governed by the patient's age. In the treatment of young women the dosage was small and repeated if necessary. Hæmorrhage was controlled in all but 3 cases. In 1 case, that of a woman 35 years of age, 916 milligram hours had no effect on the menorrhagia, and in 2 cases, those of women between 30 and 35 years of age, less than 400 milligram hours were without effect.

The use of 600 milligram-hour applications is considered safe as regards the menstrual function, but permanent amenorrhœa was caused by a 400 milligram-hour application in the case of a woman 35 years of age and by a 600 milligram-hour application in the case of a woman 40 years of age. When less than 600 milligram hours are used the menses usually return normally in two to three months. After larger doses they may continue irregularly for two or three months and then cease.

In one case in which a 200 milligram-hour exposure was given for chronic endocervicitis conception occurred eight months later, abortion at the third month, and hydatid mole.

All cases in which leucorrhœa was present previous to radiation were cured. The discharge continued, however, for one to two weeks following the treatment.

In 3 cases which received a 2,400 milligram-hour exposure severe menopause symptoms developed, while in 13 cases which received a 1,500 to 2,100 milligram-hour exposure these symptoms were mild.

Eight cases of hæmorrhage at the menopause were treated with excellent results by 1,200 to 1,800 milligram-hour exposures. E. L. CORNELL, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Ruth, C. E.: Detachment of Adherent Placentæ and Delivery in Abortion. *Am. J. Obst. & Gynec.*, 1921, i, 700.

Because of the dangers of the use of the curette and auger and the uncertainty that either instrument, even in the hands of the most skillful, will remove all the secundines, attempts to detach and deliver an adherent, retained placenta in abortion are no longer made by a large majority of obstetricians. Many openly advocate allowing such placenta to undergo disintegration in the uterus but those who recommend such a course at term are very few.

Retained secundines are always a source of danger, and their retention can serve no useful purpose in any case. Failure to remove them at once in a case of adherent retained placenta is an admission that the physician believes he cannot effect its removal safely.

The author is of the opinion that the placenta can be safely detached and removed in every recent case without danger of perforating the uterus, leaving a portion of the secundines, introducing infection, or spreading sepsis by opening new uninvolved areas.

Ruth's method consists of the use of a forceps-like instrument which can be made to conform to the uterine wall when the uterus is too small to admit the introduction of the hand. This instrument is too dull to denude mucosa and too blunt to penetrate when used with care, and if kept in contact with the uterine wall and rotated always in the same direction while the uterus is steadied through the abdominal walls with the other hand, every segment of the wall may be reached and the separation completed. Removal is then simple.

Rucker, M. P.: Apoplexy of the Placenta. *South. M. J.*, 1921, xiv, 318.

Following a review of the literature to date the author reports six cases. The data regarding the blood pressure and the condition of the urine are given in tables and a photograph of the placenta from one of the cases is shown. The most characteristic sign of the condition was a symptomless and rather sudden rise in the blood pressure which resisted all treatment. There was absence of subjective symptoms in nearly every instance and the Wassermann test was negative in all. The following conclusions are drawn:

1. The term "apoplexy of the placenta" would seem appropriate on account of the hæmorrhage usually present in these infarcts, and on account of the rather sudden appearance of the clinical signs.

2. The association of large white and red infarcts in the same placenta, the presence of necrotic areas

in the center of many of the infarcts, and finally, the presence of clotted blood in many of these infarcts with signs of premature separation of the placenta suggest that this may be the sequence of events in certain cases of oblatio placentæ.

3. Apoplexy of the placenta presents a definite clinical syndrome which makes it possible to recognize it by observing the patient carefully in the latter part of pregnancy.

C. H. DAVIS, M.D.

LABOR AND ITS COMPLICATIONS

Vignes, H., and Moreau, G.: The Effect of Nitrous Oxide Anæsthesia on Uterine Contractions
L'action de l'analgésie au protoxyde d'azote sur la contraction utérine). *Presse méd.*, Par., 1921, xxix, 234.

Nitrous oxide has been much used in the United States to decrease pain in labor. The authors gave nitrous-oxide-oxygen to 8 primiparæ and 1 multipara. The hand was placed on the uterus and the administration of the anæsthetic was begun as soon as beginning contraction was felt. After three or four inhalations it was stopped. At the end of the period of expulsion it was administered almost continuously with a great deal of oxygen.

It was found that the pain of the uterine contraction was very greatly decreased if the administration of the anæsthetic was not begun too long after the beginning of the contraction. Six women who were given the nitrous oxide at the moment the head was expelled did not feel any pain. One of these had a perineal tear and the other a forceps delivery. The anæsthetic was given for half-hour periods at intervals of half an hour. During the intervals the women begged that it be continued. The duration of the contractions was lengthened on an average thirteen seconds. In 2 cases the number of contractions per hour was decreased, in 1 it remained the same whether the nitrous oxide was given or not, and in 5 it was increased.

The authors believe that when the patient is under the influence of an analgesic voluntary effort is decreased. It was necessary to use forceps in 2 of the 9 cases, but the number was too small to warrant any conclusions. Moreover, one of the patients was a primipara 45 years of age and another a primipara of 33. No toxic effects were noted in either the mother or the child in any case but the mothers were watched closely and oxygen was given whenever necessary.

In the authors' opinion nitrous oxide diminishes the force of the uterine contractions less than any other anæsthetic and can be used safely whenever it is necessary to decrease the pain in labor.

A. G. MORGAN, M.D.

Rucker, M. P.: Potter Version; The Elimination of the Second Stage of Labor; a Report of 200 Cases. *Am. J. Obst. & Gynec.*, 1921, 1, 574.

The author describes the mechanism of Potter version in detail and analyzes teaching material, and 200 cases from his own practice and that of Carter.

In 39 cases of elective version the foetal mortality was 18.2 per cent. In the author's private practice the foetal mortality was 14.8 per cent, while in that of Carter it was 16.66 per cent. The mortality in 23 cases in which version was done in consultation was 17.4 per cent, and in a group of student cases, 17.55 per cent.

There were 3 maternal deaths, 1 from the anæsthetic, 1 from eclampsia, and 1 from influenza. There were 2 cases of pneumonia, 2 cases of shock, 3 cases of hæmorrhage, and 3 cases of sepsis.

The analysis of the 200 cases is tabulated as follows:

ANALYSIS OF CASES WITH SPECIAL REFERENCE TO INFANT MORTALITY

	Infant Mortality		
	Cases	Cases	Per cent
White.....	163	25	15.33
Negroes.....	37	7	18.91
Married.....	151	23	15.23
Single.....	48	9	18.75
Widowed.....	1	0	
Previous children:			
0.....	112	18	16.07
1.....	36	7	15.11
2.....	19	2	
3.....	10	2	
4.....	6	1	
5.....	4	0	
6.....	5	1	
7.....	2	0	
8.....	4	0	
Not stated.....	2	1	
Previous abortions:			
0.....	158	22	13.92
1.....	21	6	25.00
2.....	10	3	
3.....	2	0	
4.....	2	0	
5.....	1	0	
Not stated.....	6	1	
Blood Wassermann:			
Negative.....	127	20	15.74
Positive.....	4	1	25.00
Pelvis:			
Normal.....	140	19	13.57
Flat, contracted.....	4*	2	50.00
Funnel.....	4	2	50.00
Kyphosis.....	1	0	
Not stated.....	51	8	15.68
Position:			
L. O. A.....	90	12	13.33
R. O. A.....	25	3	12.00
R. O. P.....	50	7	14.00
L. O. P.....	11	1	9.09
Occiput unspecified.....	2	0	
Brow.....	1	0	
Breech.....	18	3	16.66
Shoulder.....	3	3	100.00

	Infant Mortality		
	Cases	Cases	Per cent
Separation of placenta:			
Duncan.....	125	19	15.20
Schultze.....	62	10	16.12
Condition of infant:			
Breathed spontaneously.....	164	8	4.87
Resuscitated.....	18	6	33.33
Stillborn (not macerated)....	16	16	
Macerated.....	3	3	
Premature.....	15	11	73.33
Postmature.....	14	10	71.42
Enlarged thymus.....	2	2	
Heart disease.....	1	1	
Hydrocephalus.....	1	1	
Maternal complications:			
Tuberculosis.....	1	0	
Influenza and pneumonia.....	3	0	
Prolapsed cord.....	3	2	66.66
Placenta prævia.....	4	1	25.00
Ablatio placenta.....	1	0	
Postpartum hæmorrhage....	1	0	
Puerperal fever.....	3	0	
Toxæmia of pregnancy.....	4	1	25.00
Eclampsia.....	2	0	
*Refused to go to hospital.			

EUGENE CARY, M.D.

Potter, I. W.: Version. *Am. J. Obst., & Gynec.*, 1921, 1, 560.

In this article Potter describes his method of eliminating the second stage of labor by podalic version. The article is illustrated with 19 photographs showing the various steps in the procedure and the correct and incorrect position of the patient. The advantages claimed for this procedure are: (1) there are no second-stage pains, (2) the soft parts are thoroughly dilated and not subjected to the pressure which causes flabbiness of the vagina and prolapse of the bladder, (3) there is no fever due to the lighting up of chronic tubal infections by pressure, (4) there is no shock, (5) bleeding is slight and the lochia less in amount, (6) the child's head is subjected to less pressure, and (7) less time is wasted by the operator.

Potter states that when the version is properly performed the maternal mortality should be nil and the morbidity less than in normal cases. He has never torn the perineum through the sphincter and only rarely up to the levator muscle. He has never injured the bladder. The foetal mortality he believes is no greater with this method of delivery than with any other, but he admits that cord complications must be seriously considered.

In one year Potter delivered 1,113 women. Nine hundred and twenty were delivered by version. In this total number of cases there were 80 abdominal cesarean sections, 2 vaginal sections, 39 instrumental deliveries, 1 instrumental deliveries on after-coming heads, 9 cases of twins, 10 cases delivered as vertex, 3 cases of face presentation (2 chin anterior, 1 chin posterior necessitating craniotomy), 13 footling, and 22 breech presentations. There were 41 still-born children and 16 cases of prolapsed cord. Thirty-four children

died during the first two weeks of life, and 2 mothers died after version, one of colitis and one of lobar pneumonia.

Potter's version differs from the operation as done by others chiefly in the following facts:

He uses the modified Walcher position and always waits for complete effacement of the cervix and an easily dilatable external os. He carefully "irons out the soft parts" with the hand, using tincture of green soap as a lubricant. Both feet are brought down after the membranes have been ruptured high up. The extraction of the child is never hastened by pressure from above; expulsion is allowed to follow uterine contractions. Both shoulders are delivered anteriorly. Extreme flexion of the head is maintained by placing one finger in the mouth and exerting gentle pressure on the occiput above the pubes. Potter does not attempt to make the child cry if the heart is beating and does not hasten the delivery even if the cord is not pulsating. He wears elbow-length gloves.

EUGENE CARY, M.D.

Cathala, A., and Perrot, B.: Resection of the Sacro-vertebral Angle in Contracted Pelvis (La résection de l'angle sacrovertébral dans les bassins rétrécis.) *Rev. franç. de gynéc. et d'obst.*, 1921, iii, 65.

Rotter and Schmid proposed and carried out resection of the promontory of the sacrum in cases of flat rachitic pelvis and those in which the prominence of the sacrovertebral angle was the chief obstacle to delivery. They resect as much as 2 cm. of the lower part of the fifth lumbar and the upper part of the first sacral vertebra. They have performed this operation on patients who were not pregnant to prevent difficulty in future deliveries and on pregnant women as a substitute for cesarean section or section of the pubis.

From an analysis of the 24 cases which Rotter and Schmid reported Cathala and Perrot conclude that the operation is not justified. The mortality was 16.5 per cent which is higher than that of cesarean section or pelviotomy. When it is performed on pregnant women it is necessary to bring the uterus outside the abdominal cavity during the resection, a procedure which is apt to cause abortion. Considered as a measure to prevent difficulty in future deliveries it can hardly be considered a success as in many cases an exuberant callus is formed which interferes with delivery as much as the original deformity.

Six patients were examined one and two years after the operation and in only one was the enlargement of the pelvis found to be permanent. Consideration must be taken also of the possibility that a woman thus operated on may never become pregnant again and she will then have undergone a serious operation for nothing. Among 23 patients treated in this manner only one has since become pregnant. Therefore the advantages gained are not sufficient to compensate for the risks.

A. G. MORGAN, M.D.

Nubiola, P.: The New Technique of Subcutaneous Symphysiotomy (La nueva tecnica de la sinfisiotomia subcutanea). *Arch. de ginecop.*, 1920, xxxiii, 279.

Symphysiotomy as performed by Zarate has recently met with much favor in Latin-American countries. This technique is described by Nubiola as follows:

The urethra is displaced to the left by two fingers of the left hand inserted into the vagina and the clitoris is pulled downward with the thumb. A bistoury is then introduced at the midpoint of the symphysis and the fibrocartilage above and below is sectioned until the arcuate ligament is reached. A few of the greater fibers are sectioned by several small cuts and the remainder disinserted by forceful flexion and abduction of the thighs by two assistants.

Zarate states that when this method is used there is no wounding of the corpora cavernosa or dorsal vein of the clitoris, hæmorrhage is very slight, there is no hæmatoma formation or consequent thrombophlebitis, injuries to the urinary system are slight, and delivery is rarely instrumental.

Nubiola has made an extensive study of the method and admits that the subcutaneous technique reduces the incidence of the former sequelæ and complications of symphysiotomy, such as infections. Many of the undesirable complications, however, such as venous wounds and hæmatoma formation, still persist, depending upon the extent of pelvic contraction and the size of the foetus. When the pubic cartilage is destroyed and the arcuate ligament is sectioned there is no protection for the underlying soft tissues and therefore urinary lesions often result.

A 2 cm. separation of the pubic bones would increase the conjugate only 4 mm. and Nubiola does not regard this as sufficient to warrant Zarate's contention that subcutaneous symphysiotomy is indicated absolutely in all cases of dystocia in which the true conjugate is $7\frac{1}{2}$ cm. in a flat pelvis and 8 cm. in a generally contracted pelvis. The greatest increase in diameter obtained by this method is 5 mm. which the author regards as usually insufficient for spontaneous delivery without forceps.

When forceps must be applied trauma to the maternal soft tissues is almost sure to result. The urogenital diaphragm is torn from its insertion because its superior fascia is inserted directly into the corpora cavernosa of the clitoris and therefore hæmatoma formation to a certain degree is almost certain. Nubiola fails to see any advantage of symphysiotomy over pubiotomy which he has employed for a number of years. W. R. MEEKER, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Evans, G.: Vascular Change During Uterine Involution. *Lancet*, 1921, cc, 689.

The author deals only with the histologic changes of uterine involution, i. e., the presence or

absence of fatty degeneration in the muscle fibers of the arteries. It is generally believed that fatty degeneration does occur. The author removed a specimen from a patient with a twenty-seven weeks' pregnancy and cervical cancer twenty-four days postpartum, fixed it in formol-saline, and after embedding the parts in gelatin, cut frozen sections. Some of these sections were stained with Sudan III and acid hemalum, some with Van Gieson and acid hemalum, and others with Weigert's elastica and eosin.

The most striking changes were observed in the intima; cellular proliferation and hyaline swelling of the subendothelial layer were found with swelling and splitting of the internal elastic lamina. In the media was a granular atrophy of the muscle fibers. Attention was attracted by the absence of fatty degeneration in the medial coat of the blood vessels and in the musculature of the uterus.

After ligation fatty degeneration has been observed in the involution of vessels. The presence or absence of fatty degeneration in uterine involution is of importance for a proper understanding of the changes in the varied arterial lesions described under the term arteriosclerosis. Thoma is quoted to the effect that arteriosclerosis is produced largely by slowing of the blood stream.

Basing his statements on the changes noted in the illiæ and hypogastric arteries in the new-born

infant, the author opposes Thoma's hypothesis because of the characteristic presence of fatty degeneration in the histologic picture of arteriosclerosis and its absence in normal involution. This distinction will fail when it is proved that fatty degeneration occurs in the media of arteries in puerperal involution of the uterus.

Past observation on the subject is typified by that of Goodall who states that the muscle cells of the parent media undergo fatty degeneration at an early stage in the process of involution and all the chronic inflammatory diseases, blood dyscrasias, and possibly malignant growths modify the normal complete involution. Goodall's cases in which observations as to fatty degeneration were made fall in this group. Five of six cases noted by him showed subinvolution and one a morbid lesion which might interfere with involution. Death was caused in all cases by a disease which in itself would produce fatty degeneration of muscle fibers.

Helme's experiments on rabbits are discussed primarily with regard to fatty degeneration during involution. He found no instance of this in the involuting uteri of ten rabbits.

In conclusion Evans states that there is a conflict of observations and the question of the presence or absence of fatty degeneration in the media of the vessels in the puerperal uterus is not as yet definitely settled.

W. N. ROWLEY, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Bérard, E., and Dunet, C.: The Hydatid Thrill; Hydronephrosis Simulating a Hydatid Cyst of the Liver (Critique de frémissement hydatique: à propos d'une hydronéphrose simulant un kyste hydatique du foie). *J. d'urol. méd. et chir.*, 1921, xi, 1.

In a case reported by the authors a mobile tumor occupied a large part of the abdomen. Among other characteristics it had a most typical hydatid thrill throughout its entire extent. This finding, taken into account with others, led to the diagnosis of a hydatid cyst on the lower surface of the liver.

At laparotomy the tumor was found to be retroperitoneal and clearly a latent hydronephrosis which once had been ruptured by strenuous effort. At the time of the rupture a subumbilical laparotomy had been performed for the evacuation of the fluid and the abdomen was closed without further examination. The hydronephrosis had subsequently re-formed.

Maire, in dealing with the diagnostic difficulties in severe cases of hydronephrosis, reported four cases in which the tumor was mistaken for a hydatid cyst of the liver. In none of these, however, was the error due to the presence of a hydatid thrill. In the authors' case the thrill was very distinct and the tumor seemed to be continuous with the liver.

W. A. BRENNAN.

Bumpus, H. C., Jr., and Meisser, J. G.: Focal Infection and Selective Localization of Streptococci in Pyelonephritis. Study I. *Arch. Int. Med.*, 1921, xxvii, 326.

In most cases of pyelonephritis a gram-negative motile bacillus, believed to be the colon bacillus, is generally the predominating organism in the urine. Therefore, investigation and treatment in the past have been directed against this organism. While foci of infection about the teeth and tonsils have been regarded with suspicion as causative factors, the rarity with which colon bacilli were isolated from them made their etiological rôle difficult to explain. The frequent association and simultaneous onset of oral sepsis and pyelonephritis led to the experimental work reported.

Six cases of subacute pyelonephritis in which the colon bacillus was found in the urine were studied. In each case there was also other evidence of sepsis in the form of abscessed or devitalized teeth and septic tonsils. Cultures from the granulomata after the surgical removal of the abscessed teeth and cultures from the roots of the devitalized teeth in each case gave pure strains of a green-producing streptococcus. A similar organism was found to predominate in cultures from the tonsils. These

cultures, when injected intravenously into rabbits, produced marked lesions of the kidneys in 88 per cent of the animals. Extra-urinary lesions occurred in a much lower percentage of cases, the greatest number being found in muscles and joints, in which there was slight involvement in 14 per cent.

The lesions in the kidney were found mostly in the medulla and appeared as white necrotic streaks surrounded by marked oedema and associated with hæmorrhage. The cortex occasionally presented small opaque yellowish-white areas.

Microscopic sections showed short chain streptococci to be the only organisms present, and cultures made from the kidneys of the animals always gave pure growths of a green-producing streptococcus which on injection into other rabbits again localized in the kidneys. This demonstrates the marked elective affinity of this organism for renal tissue.

Following the extraction of the teeth or the removal of the tonsils in the reported cases there was in every instance marked exacerbation of the patient's urinary symptoms associated with a serious febrile reaction. During the reaction a green-producing streptococcus was recovered, with the colon bacillus, in the urine which had formerly contained only the colon bacillus. When mixed cultures from this source were injected into rabbits, elective localization in the kidneys again occurred. Cultures made from the lesions in the kidneys of the rabbits showed a green-producing streptococcus to be the causative organism as in the former cases.

The authors believe the elective localization was not due to the incubation of the bacteria in artificial media or to an overwhelming dosage resulting from their increase in numbers. Proof of this was the fact that when pus was expressed from the patient's tonsils and injected into rabbits without incubation the same elective affinity for renal tissue was shown as in the cases in which 3 to 5 c.c.cm. of glucose brain-broth cultures were used.

The authors conclude, "It seems from our study that pyelonephritis may often be due to focal infection harboring streptococci which have a selective affinity for the urinary tract, and that the colon bacillus, which is commonly found and generally believed to be the cause, is of secondary importance."

Amati, A.: A New Urine Test for the Diagnosis of Nephritis and Malignant Tumor (Una nuova indagine sulle urine per la diagnosi di nefrite e di tumore maligno). *Policlín.*, Roma, 1921, xxviii, 287.

The author has already published his experimental findings with regard to urinary hæmolysis.

He found that normal urine is never hæmolytic, showing rather in the majority of cases an anti-hæmolytic tendency. This anti-hæmolytic action is in no way related to the specific weight or the other physical constituents of the urine.

In a small percentage of cases of nephritis and malignant tumors the urine was truly hæmolytic, but the findings were not constant even in the same case, being manifested only in certain phases of the condition.

In another series of experiments Amati endeavored to find the degree of normal anti-hæmolytic power in the urine by adding to it different amounts of a hæmolytic substance. The anti-hæmolytic substance chosen was distilled water. He found that in order to become hæmolytic, physiologic urine requires a very decided dilution with distilled water. The least amount of dilution necessary to render it hæmolytic (which is practically constant for all urines) he terms the "uro-hæmolytic constant." This constant is ordinarily equal to $5/6$, but may oscillate between $2/3$ and $10/11$. That is to say, a given volume of physiologic urine must have between $2/3$ and $10/11$ of its volume of distilled water added to it before it becomes hæmolytic.

In pathologic urines it was found that the uro-hæmolytic constant is much lower. In cases of nephritis and malignant tumors it ranges from $1/11$ to $1/3$.

The test described is simple, has interesting diagnostic applications, and is within the ability of any practitioner. It should be included in the common laboratory tests in doubtful cases of nephritis and malignant tumor.

W. A. BRENNAN.

Miller, E. M., and Herbst, R. H.: Papillary Epithelioma of the Kidney Pelvis. *J. Am. M. Ass.*, 1921, lxxvi, 918.

This paper is based upon a report of one case. The authors state that papillary epithelioma of the kidney pelvis may rightly be called a rare tumor and in support of their statement they quote Watson and Cunningham, Israel, Wilson, Braasch, and others.

The case reported was that of a man 46 years of age who complained of pain in the left groin and hæmaturia. In the beginning the pain had been localized in the region of the kidney and was so severe that the administration of morphine was necessary to relieve it.

Examination showed tenderness over the left kidney but no palpable tumor. A pyelogram showed a large pelvis, the center of which was very light. There was also an increase in the width of the ureter.

Nephrectomy was performed. The kidney pelvis was the size of a large hen's egg. The parenchyma had been thinned by pressure of the distended pelvis and was very pale. The tumor apparently had not invaded the parenchyma and did not extend downward into the upper 3 in. of the ureter.

Microscopic examination showed areas which were relatively benign in appearance and other areas which were definitely malignant.

Papillary epithelioma is about twice as common in males as in females and develops as a rule between the ages of 50 and 60. The authors discuss the pathology and describe the more common symptoms.

With reference to the treatment they quote Braasch who states that from the therapeutic point of view these cases may be divided into two groups, those with and those without bladder involvement. In the former nothing short of complete removal of the kidney and ureter followed later by fulguration of the bladder implantations will suffice. If the procedure is reversed, endless trouble may arise. Obviously in cases of the second group removal of the affected kidney and the entire ureter is indicated as soon as the diagnosis is made.

H. L. KRETSCHMER, M.D.

Sussini, M. and Garrahan, J.: Perinephritic Abscess Simulating Coxalgia; Three Cases of Infants (Absceso perinefrítico simulando coxalgia; tres observaciones en niños). *Semana méd.*, 1920, xxvii, 824.

In the first case, that of a child 17 months of age, the illness began with loss of appetite and weight, mild fever, and pain in the right hip which prevented walking. The hip was maintained in flexion and there was local tenderness. A plaster of Paris spica was applied, but as subsequent X-ray and tuberculin tests were negative it was removed after about ten days. The physical examination showed resistance and tenderness in the region of the right flank. A painful tumor could be palpated in the kidney region. Fifty cubic centimeters of pus were aspirated. The cultures showed staphylococci. The abscess region was then incised widely by an oblique incision and about 200 c.cm. of pus were drained. Drainage continued for about two weeks. Twenty days later healing was complete.

The second case was that of a boy 4 years of age who had been ill about twenty days. He complained of difficulty in walking and maintained the right hip in flexion. The symptoms gradually grew worse so that the hip could not be extended without extreme pain. The right renal region was somewhat fuller than normal but the overlying skin was unchanged. Under chloroform anæsthesia an indurated and irregular tumor mass could be palpated in the right flank. Diagnostic puncture showed the presence of bloody pus. Oblique incision in the renal region with free drainage resulted in a cure.

The third case, that of a child of 4 years, had been diagnosed as coxalgia and a plaster of Paris spica on the hip had been worn for fifteen days. During the changing of the cast a painful tumor in the lumbar region was found. It was thought that this might be the result of trauma from the cast but diagnostic puncture showed the presence of thick pus. The same treatment as that given in the other cases led to recovery.

The diagnosis of cases of this kind is not easy. Often a study of the urine will direct attention to renal pathology, but in the cases reported the urine was negative and therefore the abscess condition could not have been due to renal involvement. Neither did the history clarify the etiology. It is known that such primary abscesses may follow a chill or an acute febrile disturbance, or may be caused by pus flowing from some other part such as the spine. In other cases slight traumatism producing hæmorrhage may make the perinephric region a point of least resistance and lead to the formation of an abscess of hæmatogenous origin. The causative injury may be produced by a fall, coughing, carrying a burden, or lifting. In one of the cases reported trauma from the plaster cast may have been a predisposing cause.

W. R. MEEKER, M.D.

Lowsley, O. S.: A Perineal Operation for the Removal of a Stone in the Lower End of the Male Ureter. *Surg., Gynec. & Obst.*, 1921, xxxii, 300.

During the course of a difficult seminal vesiculectomy it was necessary, for safety, to identify the ureters. This was easily accomplished. The idea of attacking a stone in the lower 2 in. of the ureter through the same route suggested itself. The technique developed after dissection on the cadaver is as follows:

With the patient in an exaggerated lithotomy position a horseshoe-shaped incision is made, the curve being above the bulbous portion of the ureter and the ends well to each side of the rectum. The incision is deepened, the central tendon incised, and the apex of the prostate exposed. The rectourethralis muscle is severed and the levator ani muscles are separated to expose the posterior surface of the prostate covered by the fascia of Denonvilliers. A sound in the urethra acts as a guide during the blunt dissection. This is now removed and the gland and seminal vesicles are pulled forward by a blunt-toothed retractor placed beneath the base of the prostate. At this point it is well to elevate the foot of the table considerably as the wound is deep and the ureter is on its roof. The intervesicular fascia is next incised to expose the ampulla of the vas and the seminal vesicle of the affected side.

The rectum is held back out of the way by a long deep retractor such as is used in perineal prostatectomy. The ureter is found emerging just above the very tip of the seminal vesicle. It is isolated from the surrounding tissues by blunt dissection, the vesicle being freed and lifted up slightly. A tape is then passed around the ureter above the stone if possible. A longitudinal incision over the stone is made in the ureter and the stone removed with bulldog forceps. The incision in the ureter is not closed, a cigarette drain being carried down to this point. Closure is effected by drawing the separated levator ani muscles together with one or two sutures of plain catgut. The skin is closed with silkworm-gut sutures.

In order to hasten the closure of the ureteral wound a catheter may be passed by means of the cystoscope and allowed to remain for a day or two. One case in which this technique was employed is reported in detail. The literature is reviewed briefly.

The conclusions drawn are as follows:

1. The removal of a stone by the perineal route should not be attempted if the stone is more than 4 cm. from the bladder and if it is not fixed in its position.

2. A stone impacted at the point where the ureter joins the bladder wall is accessible through the perineum unless the patient is obese.

3. If a stone is successfully removed from the ureter by the perineal route the patient may be allowed out of bed after the second day. The downward drainage would seem to be a decided advantage in that the chances of thick scar formation around the ureter are less.

H. A. FOWLER, M.D.

GENITAL ORGANS

Bolognesi, G.: Dissociation of the Seminal Tract (Sulla scontinuità delle vie spermatiche). *Arch. ital. di chir.*, 1921, iii, 207.

Bolognesi reviews the literature regarding the effect of the various operations on the testicles, vas deferens, and spermatic cord. He himself performed experimental work on dogs, rabbits, and guinea pigs to determine the effect on the testicle of excision of the epididymis and vas deferens, the effect on the epididymis of removal of the testicle, and the effect on the testicle of transplanting it in the same animal. He describes his histologic findings in detail and illustrates them with numerous photomicrographs.

It was found that bilateral excision of the epididymis and vas deferens caused more or less rapid atrophy of the seminiferous tubules of the testicle which varied in degree from simple reduction in the number of the epithelial cells to complete liquefactive degeneration of the tubules. This was associated with hyperplasia of the interstitial tissue proportional in degree to the atrophy of the tubules and with hypertrophy of the interstitial cells which sometimes invaded the degenerated tubules. The weight and general condition of the animals were not affected.

Bilateral removal of the testicles caused a slower and less pronounced atrophy of the epididymis characterized by simple reduction in the number and size of the epithelial cells of the efferent tubules. In most cases the lumina of the tubules were contracted, but occasionally they were dilated. In addition, hyperplasia of the interstitial tissue, cells similar to the hyperplastic interstitial cells in the testicle, and free cells undergoing phagocytosis in the lumina of the tubules were observed. The changes in both classes of cases were due chiefly to interference with the secretory and excretory functions of the glands, but to a small extent were caused by the surgical lesions due to the operations.

The free cells in the tubules of the epididymis, for instance, were doubtless due to the latter.

Free transplantation of the testicle was followed by rapid liquefaction and complete absorption of the seminal epithelium and by marked hyperplasia of the interstitial cells, many of which were transformed into large polynuclear cells.

As a means of comparing experimental and clinical lesions of the male genital tract the author gives the histories of a case of cryptorchidism, a case of lesions of the vas deferens and the vessels of the cord due to a badly performed operation for varicocele, and a case of chronic tubercular inflammation of the epididymis and vas deferens. He found the changes similar to those observed in the animals, but less intense and less rapid in development.

The article is concluded with an extensive bibliography. A. G. MORGAN, M.D.

Sievers, R.: A New Method of Treating Retention of the Testicle with Short Spermatic Cord by Drawing the Spermatic Cord Through the Obturator Foramen (Durchführung des Samenstrangs durch das Foramen obturatorium; ein neuere Vorschlag zur Behandlung der Retentio testis bei absolut verkürztem Samenstrang). *Deutsche Ztschr. f. Chir.*, 1920, clx, 159.

The author mentions briefly the many methods of operating in cases of undescended testicle and discusses the principles involved in each. He says there are many cases which offer great difficulties because of shortness of the spermatic cord. These difficulties explain the frequent failure of operation, the incidence of which varies according to different statistics from 18 to 34 per cent. They also justify the suspicion that in numerous other cases in which the testicle is fixed in the scrotum by stretching the cord the function of the testicle is injured by the traction.

Sievers therefore attempted to find a method by which, even in very difficult cases, the testicle might be brought down to the scrotum without strong traction. He believed this could be accomplished best by shortening the distance between the bladder and scrotum. In experiments on the cadavers of children he found that the shortest and simplest method consisted in bringing the testicle and cord through the intact bony ring of the obturator foramen. After a description of his operation which he has performed thus far only on cadavers, he summarizes his article as follows:

1. The typical radical operation for undescended testicle consists in cutting the processus vaginalis peritonei and bringing the cord down into the pelvis by the method of Schueller and Kocher.

2. If it is not possible to bring the testicle into the fundus of the scrotum by this method without tension on the cord, no complicated attempts at fixation and extension should be made as they are apt to injure the function of the testicle. Instead, the course of the cord should be shortened.

3. This may be done by bringing the cord through the median segment of the obturator foramen.

4. The new operation removes the cord completely from the inguinal region and therefore is to be recommended also for those cases of radical operation for inguinal hernia in which, on account of the size of the hernia or recurrence, adequate closure of the abdominal wall is difficult. DENCKS (Z).

Ottow, B.: Eugenic Prevention of Conception by Vasectomy and Autotransplantation of the Testicle (Ueber eugenetische Konzeptionsverhinderung und die biologischen Grundlagen generativer Prophylaxe durch Vasectomie und Autotransplantation der Hoden). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1921, liv, 219.

There has been a very lively discussion in recent years as to how far it is justifiable to perform abortion because of mental disease and whether it is ever justifiable to perform it for purely economic reasons such as poverty and poor living conditions which would make it difficult or impossible to give the child proper care and food.

Plaut and Meyer both hold that it is not justifiable to perform abortion on account of nervous and mental disease in the parents because the laws of heredity are not well enough known, but Meyer mentions the case of a pregnant woman with severe epilepsy who had had three children, one of whom was insane and the others idiots from birth. In the author's opinion there can be no doubt as to the inadvisability of allowing a child to be born to such a mother. He believes that interruption, or at least the prevention, of pregnancy in women with a psychopathic constitution is justified by statistics.

Hirsch found that 75 per cent of the descendants of weak-minded parents are mentally defective, and that 82 per cent of weak-minded persons have parents with a psychic defect. The corresponding figures given by Kraepelin are 60 and 70 per cent.

The best method by which the male may be rendered incapable of causing conception is resection of the vas deferens, as this does not interfere with his normal sexual life nor affect his secondary sexual characteristics. Another method consists of autotransplantation of the testicles. The transplantation of testicles for other purposes is also discussed. AUDREY G. MORGAN, M.D.

Vivian, C. S.: The Operative Treatment of Gonorrhœal Epididymitis. *Ann. Surg.*, 1921, lxxiii, 357.

Vivian reports the treatment of 100 cases of gonorrhœal epididymitis by a modified Hanger operation. This procedure he believes is the best method of curing gonorrhœal epididymitis in any stage. By releasing the tunica and puncturing the vas it relieves the pressure which occludes the radicles of the vas.

The skin of the scrotum is incised widely in front under general anæsthesia and separated from the tunica, but the capsule of the testicle is not opened. After a vasopuncture the tunica is dissected free

from the epididymis, turned back, and sewed with catgut behind the cord.

Superficial incisions are then made into the epididymis and through one of them a dull probe is introduced for exploration. At the lower angle of the wound a rubber tissue drain is inserted and fastened with catgut through the rubber and the covering of the epididymis. This having been done, the testicle is returned to the scrotum and the skin is sewed with silkworm gut.

The relief of all symptoms is immediate. The drain is removed in four days and the patient is able to be up and about in a week. The wound, however, will continue to drain a week longer.

In a re-examination of several of his cases of bilateral epididymotomy Vivian found spermatozoa in the semen. He insists that epididymotomy will usually cure the morning drop, and that epididymitis has never been known to recur on the side on which the operation has been done correctly.

B. F. ROLLER, M.D.

Player, L. P., and Mathé, C. P.: A Study of Tumors of the Vesical Neck and the Prostatic Urethra and Their Relation to the Treatment of Chronic Prostatitis. *J. Urol.*, 1921, v, 177.

For some time Player and Mathé have recognized the fact that many cases of persistent and recurrent prostatitis and seminal vesiculitis are due to inflammatory tumors of the posterior urethra. Their observations corroborate the findings of others.

In this article they present an analysis of 68 additional cases of tumors of the posterior urethra and vesical neck associated with chronic posterior urethral infection. The four most common symptoms in the order of their frequency were pain and discomfort in the perineum, constant or repeated morning drop, backache, and a sensation of itching at or within the meatus.

An accurate diagnosis of this condition can be made only by means of the water dilating cystourethroscope. Infections of the upper urinary tract and urogenital tuberculosis were ruled out in all instances.

It is suggested that these tumors may be retention cysts of some of the many glands of the posterior urethra and vesical neck. Three types are observed: (1) true pedunculated polypi, (2) sessile polypoid masses, and (3) oedematous excrescences.

Histologically the polypus or polypoid mass may be either glandular or fibrous.

The authors believe that all of these tumors begin as oedematous excrescences, advance later to the polypoid mass type, and finally become pedunculated polypi.

Case reports and excellent photomicrographs of the tissue are presented.

In the treatment of this condition Player and Mathé used various methods:

1. Urethral dilatation with sounds and posterior dilators. This gives the best results in cases of simple oedematous excrescences.

2. Direct application of cauterizing agents such as silver nitrate and the stronger acids.

3. Snaring through the endoscope and cystoscope.

4. Excision by means of scissors.

5. Crushing the pedicle by means of 'rongeur' forceps.

6. Destruction by means of the actual cautery.

7. Electrocauterization.

In most cases the best results were obtained with the electrocautery using the d'Arsonval current.

After the destruction of the tumor local treatment to the prostate and vesicles is delayed for one month. Marked improvement resulted in 73 per cent of the cases, slight improvement in 20 per cent, and no improvement in about 6 per cent.

In conclusion the authors state that every patient with long-continued symptoms suggesting posterior urethral infection and evidence of prostate or seminal vesicle infection should be examined carefully with the urethroscope as the condition may be due to a local cause such as inflammatory tumors of the urethra and the neck of the bladder.

HARRY CULVER, M.D.

MISCELLANEOUS

Bartrina, J. M.: The Reflexes of the Genito-Urinary Tract (Les réflexes de l'appareil genito-urinaire). *Presse méd.*, Par., 1921, xxix, 293.

In 1919 Vernet and Gallart Monés of Barcelona reported their discovery of a new sympathetic ganglion in man which they termed the "inferior mesenteric ganglion." This ganglion was already known in comparative anatomy. It is a single fusiform ganglion situated on the median line in front of the aorta, just at the point of emergence of the inferior mesenteric artery. It bears a relationship to the renal and reno-ureteral plexus and to the bladder, colon, rectum, uterus, uterine adnexa, and the prostate and other male genital organs.

Very little is known definitely regarding the urinary reflexes. The discovery of the inferior mesenteric ganglion, however, explains certain facts. For instance, it explains why renal disease may be accompanied by intestinal disturbances and an intestinal condition by renal disturbances. The reno-ureterovesical reflexes, the reflexes of the urinary tract upon the genital tract, and the urinary and digestive reflexes become a very interesting study in view of the anatomical findings of Vernet and Monés.

Bartrina reports a study of the reno-renal reflexes in a man 24 years of age with lithiasis of the right kidney who had been operated upon twice unsuccessfully for the condition. He had repeated nephritic colic and progressive uræmic intoxication. The urea in the urine was reduced at first to between 3 and 5 gr. per liter and later to 1 gr. Ambard's constant was extremely high, 0.364. Radiography showed a single calculus in the kidney pelvis. The presence of this calculus had not prevented the operatively opened kidney from healing without the formation of a fistula. The total quantity of urine obtained by

catheterization in twenty-four hours was only 850 c.cm.

The condition was diagnosed as a reflex renal inhibition due to fixation of the diseased kidney in an abnormally low position and the presence of a calculus in the pelvis. Nephrectomy verified the diagnosis. After three days the patient began to improve, the amount of urine and urea eliminated constantly increasing to normal.

This case is reported not so much because of the paradoxical recovery from uræmia following nephrectomy, but because it suggests that in anuria the other kidney is not necessarily involved and that renal neuralgias, the disturbances accompanying renal ectopia, and the effects of operation in cases of so-called essential hæmaturia might be the result of a disturbance of renal innervation due to the selective action of certain toxins on the nervous system. The renal parenchyma eliminated little more than 1 gr. of urea per day before the operation, but three days afterward, though less in quantity and functioning under more unfavorable conditions, it eliminated 68 gr. in the same period of time. W. A. BRENNAN.

Stérian, E.: The Treatment of Gonorrhœa with a Polyvalent Serum (Sur la sérothérapie antigonococcique polymicrobienne). *J. d'urolog. méd. et chir.*, 1921, xi, 81.

The author is convinced that the various lesions of gonorrhœa are not caused by gonococci alone, but are due also to various associated micro-organisms, especially staphylococci, which are almost always found with the gonococci in the discharge. In this connection he draws attention to the fact that the gonococcus is almost identical in its morphological and biochemical characteristics with the meningococcus, the micrococcus catarrhalis, and the diplococcus siccus and flavus, all of which are present more or less normally as saprophytes in the upper respiratory tract. Several authors have been led to the conclusion that the gonococcus and the meningococcus are representatives of the same species of bacteria which have become slightly differentiated from a pathogenic point of view by long adaptation to different habitats. If these theories are correct, a polyvalent serum is necessary in the treatment of gonorrhœa.

During the first few days of a gonorrhœal discharge the urethral discharge shows relatively few micro-organisms. These are only gonococci and all of them are intracellular. This is the beginning of the organic defense against the bacterial invasion and is directed against the gonococci. The toxin of the gonococci is only slightly diffusible and therefore it is less dangerous for the phagocytes. The associated bacteria, which have greater virulence and more diffusible toxins, have not yet been acted upon by the opsonins and are proliferating undisturbed in the deeper tissues.

As the disease passes into chronicity the associated micro-organisms appear. As then the gonococci do not have all the phagocytic action directed

against them, they appear in extra-cellular groups. At this period phagocytosis is not the only defense of the organism; precipitins and agglutinins are acting on the gonococcic antigen. The gonococci are, so to speak, the advance army which is sacrificed to enable its allies to prepare for the attack. Phagocytic action directed against two or more species of different virulence or toxicity first attacks the species which is less virulent or provided only with endotoxins. This explains the increased virulence of antigens when different bacteria are associated. *In vitro* pure cultures become attenuated and feeble; *in vivo*, when they return to association with other micro-organisms, they increase in virulence.

The work of Roux and Yersin on the increased virulence of Loeffler's bacillus when cultivated with streptococci and the research of Widal, Vincent, and others on the increased virulence of the typhoid bacillus in the presence of pyogenic streptococci show the profound effect on one species of micro-organism of association with other species and demonstrate that the former, after isolation, preserves a part of the toxic power of the latter.

The author obtained his serum by hyper-immunization of animals, using as an antigen the discharge from an infected urethra. He has treated 95 cases of various gonorrhœal diseases with the serum thus obtained and had successful results in 86. He gives the detailed histories of 16 cases. He has used as much as seven injections of 15 c.cm. each, but generally two to four of 10 to 15 c.cm. are enough. These injections cause quite a severe local reaction characterized by redness, swelling, and diffuse pain. The general reaction varies with the individual. As a rule, fever of 38.5 to 39 degrees C for twenty-four hours or longer, night sweats, headache, and insomnia, especially after the first injection, result.

The sixteen cases described included 8 cases of prostatitis (7 surgical and 1 chronic) which were cured in eight to fifteen days by two to four injections; 1 case of unilateral epididymitis which was cured in six days by two injections; 1 case of bilateral epididymitis which was partially cured in sixteen days by three injections; 1 case of unilateral epididymitis which was cured in eight days by three injections of goat serum fourteen months old; 1 case of acute urethritis which was cured in two weeks by three injections and irrigation; 1 case of acute urethritis which was very much improved in seventeen days by two injections of goat serum; 1 case of polyarthritis of the thumb and ankle; 1 case of generalized rheumatism which was very much improved but not completely cured after seven injections; 1 case of generalized rheumatism cured by three injections in twenty-two days; and 1 case of folliculitis cured in nine days by three injections of goat serum fourteen months old. The author gives the age of the goat serum to show that it keeps its efficiency for a long time. In the other cases horse serum from four to seven months old was used. A. G. MORGAN, M.D.

Bertoloty, R.; Gonorrhœal Processes Treated by Diathermy (Algunos casos de procesos blenorragicos tratados por diatermia). *Med. Ibera*, 1921, xiv, 4.

Bertoloty reports two series of cases of gonorrhœal processes in one of which diathermy was the only method employed and in the other of which diathermy was combined with other methods of treatment. The series included all of the usual gonorrhœal infections, anterior and posterior urethritis, epididymitis, prostatitis and arthritis, among them being chronic lesions which would not respond to other treatment. The results in all cases were satisfactory.

The first effect of the diathermy is the relief of pain. Probably because of the molecular vibration of the mass and the active hyperæmia, the resorption of exudate is favored. The bactericidal action of the treatment is due to the fact that the gonococcus is very sensitive to heat. The temperature of the tissues can be raised to 43 degrees, an unfavorable temperature for gonococci and also for the Du Croy bacillus.

In general, the current used is about 200 ma. With the electrodes of Navarro-Canovas the treatments may be given for twenty-five to thirty minutes. The temperature must be varied according to the sensitiveness of the patient. The technique offers no difficulty except that care must be exercised in manipulating the cushions of the electrodes to avoid short circuits.

In order to obtain a constant result the heat developed by the electrodes must spread through the entire pathologic area. The method is especially adaptable to arthritis, prostatitis, and epididymitis and has cured many such chronic affections which did not respond to other treatments. Also many cases of posterior urethritis have been cured, especially those in which the condition was farthest posterior. When subsequent dilatations are necessary the strictures are rendered more permeable by the heat. In the anterior urethra the results are not as dependable because of the angle formed by the bulbous zone. In this angle the gonococci lodge and thus escape the current which travels in a straight line.

W. R. MEEKER, M.D.

SURGERY OF THE EYE AND EAR

EYE

Osborne, T. B., and Mendel, L. B.: Ophthalmia and Diet. *J. Am. M. Ass.*, 1921, lxxvi, 905.

By "ophthalmia" the authors refer more especially to keratomalacia and xerophthalmia.

In investigations on nutrition and growth conducted on albino rats cases of eye disorder were noted which were associated with the lack of fat-soluble vitamin in the diet and were relieved when butter fat, cod liver oil, or certain vegetable oils were substituted for lard in the diet.

This eye condition could not be called forth by mere under-feeding with food of a satisfactory qualitative composition. Infection was demonstrated to be no more than a secondary factor in the etiology.

These facts have been observed by a sufficient number of investigators to prove that they are more than chance coincidences.

Although nearly one-half of the thousand rats observed were on undoubtedly deficient diets, not a single case of eye disease was observed in animals other than those having a deficiency of fat-soluble vitamin in the ration.

It is pointed out that Vitamin A becomes less essential as the animal approaches maturity, and that ophthalmia is a rare phenomenon in mature animals. S. S. Howe, M.D.

Wason, I. M.: Ophthalmia Associated with a Dietary Deficiency in Fat-Soluble Vitamin (A): A Study of the Pathology. *J. Am. M. Ass.*, 1921, lxxvi, 908.

The results of the histologic examination of a considerable number of eyes of rats suffering from dietary insufficiency are summarized briefly as follows:

1. The primary etiological factor in the ophthalmia of rats on deficient diets is the lack of fat-soluble vitamin (A).

2. The nature and mechanism of the change in these rats whereby their corneas are rendered susceptible to bacterial invasion is unknown, no fundamental data having been derived from these anatomical studies.

3. The type and virulence of the organisms of secondary infection determine the course of the disease, in part at least.

4. The anatomical manifestations of the disease are characterized by hyalinization or necrosis of the outer layer of corneal epithelium, exudation of serum and cells into epithelium and stroma, and proliferation of blood vessels and fibroblasts. In advanced cases, invasion of the anterior chamber and occasionally of the posterior chamber, results.

The well-known specificity of chloroform for the liver cells, of mercury for the epithelium lining the convoluted tubules of the kidney, and of tetanus toxin for the central nervous system may possibly be analogues for a definite relationship between the absence of fat-soluble vitamin (A) and corneal lesions. S. S. Howe, M.D.

Holden, W. A.: The Ocular Manifestations of Epidemic Encephalitis. *Arch. Ophth.*, 1921, i, 101.

The author quotes statistics based on 100 consecutive cases of epidemic encephalitis. The principal symptoms were blurring of the optic disks in 4; papilloedema in 1; ptosis of both eyes in 45; ptosis of one eye only in 11; paralysis of both external recti in 17; paralysis of the right external rectus only in 14; paralysis of the left external rectus only in 13; paralysis of both superior recti in 1; paralysis of both internal recti in 4; complete third nerve palsy in 1; diplopia in 55; nystagmus in 32; irregularity in the pupils in 15; inequality of the pupils in 20; sluggishness or absence of light reflex in 35 (in 13 of which the convergence or accommodation reflex also was sluggish); weakness of accommodation in both eyes in 1; seventh nerve symptoms on both sides in 24; and seventh nerve symptoms on one side only in 49.

Holden does not regard blurring of the optic disks as characteristic of the disease as it is often found in association with over-filled and tortuous retinal veins when the general circulation is sluggish.

True papilloedema is rare, occurring only when there are unusual complications, and is doubtless the result of increased intracranial pressure. The cause of the motor symptoms, Holden believes, is an oedema, hæmorrhage, proliferation of neuroglia, circumvascular exudation of leucocyte-like cells, or degeneration of ganglion cells. These cause pressure which may be transitory or permanent, slight or destructive. There may be all degrees or combinations of muscular palsy.

The presence of ptosis is very difficult to determine as the lethargic state may cause the patient to lie with his eyes closed. In some cases also they may be closed because of a mental disinclination to open them or because of photophobia or spasm of the orbicularis. When one eye has been kept closed a few days to prevent diplopia, its palpebral aperture will be narrower than that of the other eye when both are open.

If there is anything at all characteristic about the external ocular palsies it is the frequent association of ptosis with paralysis of the external recti.

The pupillary reactions differ from those found in cerebral lues only in the greater frequency of an

associated defective convergence and of paresis of accommodation without dilatation of the pupil.

When there is no actual loss of accommodation quick fatigue is often noted. T. D. ALLEN, M.D.

Bordley, J., Jr.: Ocular Manifestations of Disease of the Paranasal Sinuses. *Arch. Ophthalm.*, 1921, i, 137.

Bordley emphasizes the difficulty of diagnosing disease of the paranasal sinuses on the basis of inspection alone, transillumination, suction, or one radiographic plate. A roentgenologist is quoted as saying he would never give a final opinion regarding the condition of any sinus without first viewing it from six different positions.

Among the various eye conditions found associated with disease of the paranasal sinuses are optic neuritis, retrobulbar neuritis, thrombosis of the retinal vessels, oedema of the nerve head, choked disk, irregularities in the fields of vision, enlargement of the blind spot of Mariotte, other paracentral and central scotomata, and failure of accommodative power. Bordley emphasizes particularly the importance of failure of accommodative power and the enlargement of the blind spot. He calls to mind the fact that for nearly half of its length, and sometimes for more, the optic nerve lies in contact with the thin walls of either the posterior ethmoid or the sphenoid sinus and frequently with both. Damage to the nerve apparently depends more upon the thickness of the sinus walls and its proximity to the cavity of the diseased sinus than upon the intensity or the nature of the sinus disease.

Two cases are reported. T. D. ALLEN, M.D.

Wright, R. E.: Involvement of the Orbit in Disease of the Nasal Accessory Sinuses. *Brit. M. J.*, 1921, i, 561.

Orbital cellulitis is rarely primary. It is due as a rule to disease of the nasal accessory sinuses. In children acute primary sinusitis, and in adults, an acute exacerbation of chronic sinusitis is usually the cause of orbital involvement. In all cases of suppuration in the orbital tissues the nose should be carefully examined and the sinuses studied by transillumination and by means of the radiograph.

Six case reports are given. The patients, all adults with orbital complications of frontal sinusitis, were admitted to the Government Ophthalmic Hospital at Madras during the last quarter of 1920. There were two cases of typical orbital cellulitis and one of a discharging sinus in the upper lid. Radical external operations on the frontal and ethmoid sinuses were necessary. One patient presented a ptosis due to a cyst-like swelling in the upper lid, the contents of which could be evacuated through the nose. Intranasal drainage of the frontal sinus effected a cure.

In the fifth case there was "very extensive ulceration of the orbit and frontal sinuses due to gummatous disease, superimposed on which was myiasis." The sixth patient came to the hospital

because of severe supra-orbital pain. Examination showed slight swelling of the upper lid and thickening of the supra-orbital nerve. Inspection of the nose was negative, but a small amount of mucopus escaped when a probe was passed into the fronto-nasal duct. The Wassermann reaction was positive. Novocaine, followed by alcohol, was injected into the supra-orbital nerve, the anterior end of the middle turbinate was removed, the ostium of the frontal sinus was enlarged, and the anterior ethmoidal cells were broken down. Three days after the operation a third nerve paralysis developed but cleared up after about three weeks of antisyphilitic treatment. H. P. WAGNER, M.D.

Dickinson, G.: Cranial Developments Following Enucleation in Early Youth—Possible Effects in Adult Years. *Am. J. Ophthalm.*, 1921, iv, 270.

This is the report of a case in which the eyeball was enucleated at the age of 3 years. The operation was followed by great contraction of the conjunctival sac and other soft parts and very marked alteration in the walls of the orbit.

After enucleation of the eye in early youth the organism attempts to replace the defect by such increase in the surrounding bony framework as is possible. While this is of course very limited, it is sufficient to warrant the attention of operators in order that they may devise a successful method of compensating for the tissue loss and thereby prevent some of the untoward results of later years. It will be noted that the attempt to close the defect is almost entirely from above downward. The extension of the frontal ridge in some cases is half the orbital cavity and, as in the case cited, the size of the frontal sinus on the affected side is doubled. The floor and external wall remain practically the same as on the unaffected side.

The resulting enlargement of the frontal sinus on the affected side is of importance with regard to symptoms developing in later life as it tends to be a selective site for focal infections of considerable extent. In the presence of such patent cells and so great an area of mucosa, a chronic infection of a mild type persists for years and is a constant source of annoyance, even if it is not a direct causative factor of neuralgia of the ophthalmic branch of the fifth nerve.

The great discomfort and very often unbearable pain suffered by such patients, the few and too often unsuccessful remedies at the disposal of the physician, and the chronicity of the condition make the solution of the problem most desirable.

O. M. ROTT, M.D.

Shumway, E. A.: A Report of Two Cases of Concretion of the Lachrymal Canaliculus. *N. York M. J.*, 1921, xciii, 584.

In one of the cases reported the condition apparently followed a chalazion which was operated on by curettement several months before. When the patient was seen by Shumway a fistulous opening

had formed. At the operation a portion of the concretion was taken for bacteriological examination. A full report of the cultural characteristics is given. Shumway concludes that the cause was probably a bacillus in threads and chains with false branchings and spore formations and therefore not a leptothrix, cladotrix, or streptothrix.

T. D. ALLEN, M.D.

Knapp, A.: On Methods of Dealing with the Capsule in Cataract Extraction. *Arch. Ophthalm.*, 1921, 1, 115.

The author reviews the results of 300 cataract operations in which he has used various procedures, though over two-thirds were done with Kalt's blunt capsule forceps. He emphasizes the importance of keeping the wound in the cornea entirely free from portions of the capsule, and admits that if extraction within the capsule can be done without great harm, it entirely solves this problem. On account of the high incidence of vitreous loss, however, he believes that after doing an iridectomy most operators should use the cystotome or toothed capsule forceps, or both, and extract the lens without the capsule.

Numerous important points of technique are described. The advantage of the blunt forceps is that a firm grip may be procured with less danger of cutting the capsule; thus it is possible to dislocate the lens (and even to "tumble" it) or, failing this, to rupture the capsule at the periphery rather than directly at the site of contact. Often the entire anterior capsule gives away when this method is used.

T. D. ALLEN, M.D.

Snyder, W. H.: The Observation, Management, and Treatment of the Cataract Patient Before and After Operation. *Arch. Ophthalm.*, 1921, 1, 120.

The author emphasizes the importance of: (1) a thorough physical examination, (2) a thorough ophthalmic examination, including an examination of the lachrymal tract, light projection, etc., (3) the winning of the patient's confidence, and (4) daily after-care. He states that if the instruments used are boiled in any neutral light hydrocarbon oil with a boiling point of 260 degrees F., there is less danger of infection than when they are sterilized with alcohol or boiling water. He has noted that when the operation is performed in the morning the patient's first night is not as good as when it is performed in the afternoon. He uses morphine before each operation.

At the first dressing at the end of twenty-four hours the lids are not opened unless there is edema of the upper lid. At the end of forty-eight hours the eyes are opened and flushed with physiological salt solution only, unless there is some other very special indication. Mental confusion and restlessness may be prevented if some member of the patient's family visits him regularly. Snyder gives bromides and chloral for the second and third night's sleep.

At the first symptom of the lack of orientation special care should be taken. If necessary, the

patient should be allowed to sit up in bed and use the eye not operated upon. Atropine is given sparingly. On the fourth day the eye not operated upon is uncovered, and in about a week an eye-shade rather than a bandage is used to protect the eye from which the cataract has been removed.

T. D. ALLEN, M.D.

EAR

Portmann, G.: The Route of Choice in the Search for Projectiles in the Ear (Voie de choix pour la recherche des projectiles dans les coups de feu de l'oreille). *Presse méd.*, Par., 1921, xxix, 274.

Of the four routes of access for the extraction of projectiles from the ear, the supra-auricular route of Berger, the pre-auricular route, the retro-auricular route, and the combined route of Lemée, only two are of importance, viz., the pre-auricular and the retro-auricular, as the other two are only variants of these.

The author has collected the statistics of cases operated upon by Moure from 1914 to 1918. Moure always employed the retro-auricular route. Of 42 intra-auricular projectiles, 14 were in the tympanic cavity, 21 in the mastoid, and 8 in the petrous portion of the temporal bone. The extraction was always successful.

The author reports two cases in which a revolver bullet was extracted by him recently in civil practice. In the first, the bullet was embedded in the anterior labyrinthine region bordering on the anterior part of the tympanic cavity and obstructed the tubal orifice. In the second case it was in the tubal orifice in the vicinity of the tubo-labyrinthine angle. Both were successfully removed by the retro-auricular route.

The retro-auricular route gives the widest access to projectiles which are deeply embedded and very far forward, allows the extraction to be made with the minimum of danger to the surrounding organs, and leaves the least visible scar. The principal steps of this procedure are those of the radical operation for otorrhoea.

W. A. BRENNAN.

Bénesi, O.: Hypernephroma of the Ear (Hypernephrom des Gehoergangs). *Monatsschr. f. Ohrenh.*, 1920, liv, 961.

The author reports a case of metastasis from a hypernephroma which is especially interesting as no other case of this kind has been reported in the literature. He presented the patient before the Austrian Otological Society in December, 1913. At that time there was an abundant mucopurulent secretion from the left auditory canal. When this was sponged out a polypoid tumor about the size of a bean could be seen extending from the anterior wall of the canal. The tumor bled when touched with a probe. The patient was somewhat deaf because of the interference by the growth with the conduction of sound.

Microscopic examination of an excised portion of the tumor showed it to be a metastasis from a malignant hypernephroma. Further examination

then revealed a tumor almost the size of a child's head in the left kidney region. At the end of three and a half months the ear tumor had grown to the size of a walnut and completely occluded the auditory canal. Finally the skin back of the ear became pushed out and underwent necrosis, the tumor breaking through. Death occurred six months later.

Autopsy showed that the tumor had extended backward from the auditory canal into and through the middle ear. It had also eroded the inner surface of the petrous portion of the temporal bone, and had broken into the skull where it caused a protrusion of the dura. Microscopic examination of the tumors of the ear and kidney showed them to be hypernephromata.

FRIEDBERG (Z).

Hill, F. T.: Lateral Sinus Thrombosis, with Report of Seven Cases. *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 829.

In six of the seven cases reported there was a typically septic temperature associated with general septic appearance and chills, although in two cases it occurred late. Two of these six cases showed localizing signs in the neck, and another œdema over the emissary vein. Five showed a leucocytosis with increase of polymorphonuclear leucocytes, and one a leucopœnia. In four, positive blood cultures of streptococci were obtained. Three cases showed fundus changes. Metastases developed later in three of the six. One case showed one moderately high rise of temperature followed by a daily elevation each afternoon of one or two degrees, a slight

leucocytosis, paralysis of the sixth nerve, and later inflammatory signs in the neck and metastatic involvement of the shoulder joint.

The author's conclusions are:

1. The best prophylaxis for sinus thrombosis is thorough exenteration of the mastoid as soon as a diagnosis of suppurative (operative) mastoiditis is made.

2. Despite early and thorough surgery, sinus infection will occur in certain cases because of the virulence of the infection or the low resistance of the patient.

3. Operative interference should be instituted as soon after sinus infection has taken place as possible. Early operation will avoid a long drawn-out and stormy postoperative period.

4. If performed early, the ligation of the internal jugular vein followed by exploration of the sinus and the removal of its external wall would seem sufficient. The horizontal crease incision leaves the best cosmetic result.

5. Fever is the most important symptom. If otherwise unaccounted for, a septic temperature in a mastoid case which has been thoroughly operated upon should be considered as indicating sinus infection. When other conditions which might cause a bacteræmia can be ruled out, a positive blood culture makes this diagnosis certain. Chills, the blood picture, and localizing signs are of importance.

6. Operation should be performed as soon after the onset of the infection, as shown by the temperature, as it is possible to make a diagnosis.

O. M. ROTT, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Faulkner, E. R.: The Treatment of Intranasal Suppuration. *N. York State J. M.*, 1921, xxi, 118.

Faulkner states that operative treatment is usually reserved for chronic suppurations of the nose as non-operative measures are generally sufficient for those which are acute.

During the first twenty-four to forty-eight hours local treatment is not apt to accomplish much and its effect is very transient.

Opium internally in some form is indicated positively. As the discharge becomes mucopurulent, hot saline irrigations are given through one nostril with suction through the other and followed by a post-nasal douche of 10 to 20 per cent argyrol.

For the chronic conditions usually some form of operation is indicated but no definite standard of indications or methods has been established because our knowledge in regard to the various pathologic processes is still indefinite. We must endeavor therefore to associate in our minds the clinical symptoms which represent certain pathologic changes and determine our operative treatment on this basis.

As a guide in the teaching of students the author tabulates the indications for operation on the sinuses based on the clinical symptoms as follows:

1. Certain acute cases with very severe persistent pain and high temperature or symptoms pointing to extension to the orbit or cranial cavity. If treatment does not restore the natural drainage, the pressure in the antrum and sphenoid can be relieved by puncture and washing, and the frontal sinus can be relieved by removing the anterior end of the middle turbinate.

2. Chronic cases with profuse purulent discharge which will not clear up on treatment. In these cases operations to establish free drainage are indicated.

3. Cases with slight discharge but frequent acute exacerbations, chronic headache, and malaise. In this group also free drainage is necessary.

4. Cases with ozæna. When in young subjects the disease is limited to the membrane, a radical intranasal operation will often effect a cure. In older subjects, at least the formation of a free nasal opening in the antrum should be attempted.

5. Cases with nasal obstruction due to polypi, especially if complicated by asthma. In this condition a radical operation on the affected sinuses is indicated.

6. Cases in which suppuration in the sinuses acts as a focal infection manifested usually by eye or joint symptoms. In these cases free drainage is usually sufficient.

7. Cases with involvement of the nerves proximal to the sphenoid and posterior ethmoid sinuses. The nerves most commonly affected are the optic or sixth, but the third, fourth, or fifth may be involved. Free drainage is indicated.

8. Cases with signs of extension to the orbit or cranial cavity or with an external fistula indicating necrosis and cases with mucocele causing nasal obstruction or pointing externally. Such cases require the external operation.

With regard to the internal methods of operating the author states that when the ethmoid cells are diseased, exenteration of the ethmoids by Mosher's method should be done. In cases of involvement of the antrum the removal of the nasal wall is sufficient, while in disease of the sphenoid, enlarging the natural ostium suffices. In cases of suppuration of the frontal sinus, exenteration of the anterior ethmoid cells should be done if removal of the anterior end of the middle turbinate is not sufficient. No attempt to enlarge the frontal opening is advisable.

When the external methods of operating are used a simple opening with removal of enough bone for drainage and the establishment of intranasal drainage is all that is necessary in acute cases of frontal or ethmoid sinusitis. In chronic cases in which the nose is too narrow for drainage the Lothrop operation gives good results, but when an obliterating operation is necessary, the Killian procedure is best. For the treatment of involvement of the antrum the Caldwell-Luc operation is sufficient.

High septal resections are often advisable in association with the other operations mentioned.

O. M. ROTT, M.D.

THROAT

Toll, W. C.: A Tonsillectome. *J. Am. M. Ass.*, 1921, lxxvi, 1164.

In the tonsillectome described by Toll the hæmostat is made up of half rings which are folded together and locked after the tonsil has been pushed through the ring. This folding together separates the tonsil from the anterior and posterior faucial pillars and the superior constrictor pharyngeal muscle, and effects hæmostasis by crushing the connecting tissues. The knife, which is of a semi-annular form, is rotated to remove the tonsil, cutting in shear fashion past the inner surfaces of the half rings.

O. M. ROTT, M.D.

Friedman, J., and Greenfield, S. D.: Retropharyngeal Abscess. *N. York M. J.*, 1921, cxiii, 604.

In discussing their experience with 60 cases of retropharyngeal abscess the authors state that this

condition is not as rare as is usually believed, and that while it is found usually in infants and young children, it develops also in adults. In their series the youngest patient was 3 weeks old and the oldest 20 years.

There are two varieties of retropharyngeal abscess: (1) the acute or primary form which is the type usually encountered and due to organisms present in the nasopharynx and oropharynx, and (2) the chronic or secondary form which is usually due to the tubercle bacillus and originates in the bodies of the cervical vertebrae.

In the acute form the disease is a suppuration of the lymph glands situated between the posterior pharyngeal wall and the aponeurosis covering the bodies of the cervical vertebrae.

The symptoms are interference with breathing, evidences of a nasal catarrh, and, in the infant, difficulty in nursing. In some cases there are later manifestations of sepsis. The diagnosis is made by palpation. The treatment consists in opening and draining the abscess through the mouth. The use of an anæsthetic is not advisable.

O. M. ROTT, M.D.

Ferreri, G.: Respiration, Circulation, and Phonation in Cannula-Bearers and the Laryngostomized (Le condizioni del respiro, del circolo e della fonazione nei canulati e nei laringostomizzati). *Policlín.*, Roma, 1921, xxviii, sez. med., 81.

In the author's opinion the perfected technique of tracheolaryngostomy will be followed by complete restoration of the respiratory and vocalizing functions in almost all cases except those in which there is extensive destruction of the larynx and œsophageal lesions. His opinions are based on a large number of cases of laryngostomy in which he made graphic studies of the respiration, phonation, and circulation.

In some cases the operation may not be so successful because of extrinsic or intrinsic circumstances, such as irreparable nerve lesions or extensive inflammatory destruction, which have profoundly modified the whole complex apparatus of speech. A plastic operation may restore the lumen of the larynx but cannot restore its essential structure. Extrinsic defects depend upon the surgeon's skill and technique. If, for instance, the aperture of the laryngeal canal is not made precisely upon the median line the thyreo-arytenoid muscle will be compromised and while aphonia is avoided there will always be some dysphonia. In any case a very long period is necessary for the complete restoration of phonetic function. In young persons re-education of the vocal function is not difficult and the voice reaches an almost normal timbre in a relatively short period. The prospect of restoration of the voice is most favorable in cases of laryngeal stenosis due to trauma.

In all cases of laryngostomy a laryngoscopic examination after the plastic operation will show the presence of two bands which perform the move-

ments of adduction sufficiently well. If the thyreo-arytenoid muscle has been destroyed these vibrate and give a certain amount of timbre to the voice. When the vocal cords are left intact complete restoration of speech will result in time. In a case cited by the author this occurred within a period of six months.

W. A. BRENNAN.

MOUTH

Veau, V., and Ruppe, C.: The Correction of Unilateral Harelip (De la correction du bec-de-lièvre unilatéral). *Presse méd.*, Par., 1921, xxix, 321.

A harelip well operated upon shows no mucosal recess in the skin, no gaps in the continuity of the cutaneomucosal line, and no hollows or projections in the free edge.

In the experience of the authors the method of Mirault, which is generally employed in France, always allows two or three of these imperfections to persist. However, any harelip incorrectly operated upon may be easily corrected by the method devised by Jalaguier with an end-result just as good as though no previous operation had been performed.

The authors describe various secondary operations done by Jalaguier. In 10 of the cases corrected all three defects mentioned were present, in 16 cases there were two defects, and in the rest only one defect. The procedure for each type of defect is shown by illustrations.

In Jalaguier's method two parallel skin incisions of the same length are made just above the lip, one on either side of the defect, and two others from each extremity of the first down through the mucosa. Care is taken to make the skin incisions in normal tissue and to place the cutaneomucous extremities of these incisions correctly so that when the two sets of incisions are approximated there will be accurate and correct alignment.

W. A. BRENNAN.

Sebilleau, P.: Phlegmons of the Jaw Caused by Tooth Infection (Les phlegmons perimandibulaires odontopathiques). *Presse méd.*, Par., 1921, xxix, 213.

Sebilleau holds that all phlegmons in the region of the lower jaw are osteo-phlegmons having their origin in tooth infections. The suppuration begins in the alveolus, bores through its floor, involves the maxilla, and finally causes the inflammations usually called adeno-phlegmons by penetrating the periosteum and involving the surrounding tissues.

There are three varieties, depending on whether the pus evacuates on the inner or outer side of the teeth or penetrates the inferior maxilla and forms an abscess below it. In the latter case it is generally found in the region of the angle of the jaw as the molar and premolar teeth are much more apt to be affected than the canines and incisors. To demonstrate the dental origin of the abscess it is necessary only to find and remove the affected tooth; pus will then be found in the alveolus or in a small canal leading down into the bone.

Two cases are reported in which the lower jaw had been trephined from the outside for the drainage of abscesses, but suppuration continued. The teeth had not been examined. Subsequently when the infected teeth were found and removed there was prompt recovery from the osteomyelitis.

Sebileau states that most surgeons open the phlegmons by incising the skin or the mucous membrane of the mouth, but that it is much better to approach them through the alveolus of the tooth. Often simple removal of the tooth is sufficient.

A. G. MORGAN, M.D.

Huber, L. J.: The Surgical Removal of Teeth. *Dental Cosmos*, 1921, lxiii, 343.

Huber states that in the extraction of teeth the gum tissue should be separated from the teeth along the gingivo-buccal, labial, and lingual margins. With the periosteum it should be raised by means of the broad blade of a chisel about one-half the distance to the apices of the teeth to be removed. By inserting a broad-blade elevator at the osteo-interproximal spaces the teeth can then be loosened and easily removed.

M. N. FEDERSPIEL, M.D.

Ziesel, W.: Pyorrhœa Extermination: Gingivo-ectomy. *Dental Cosmos*, 1921, lxiii, 352.

Ziesel reports his method of treating pyorrhœa by a gingivo-ectomy. He has operated upon 2,500 teeth, and claims that he has obtained a cure in 90 per cent. The operation described is performed by cutting away all loose and overhanging infected and diseased tissue to eradicate periodontal infection.

M. N. FEDERSPIEL, M.D.

Nodine, A. M.: The Surgical Treatment of Pyorrhœa. *Dental Cosmos*, 1921, lxiii, 345.

Nodine advises surgery for the treatment of pyorrhœa. Under novocaine anæsthesia he removes the diseased tissue surrounding the roots of the teeth. He then packs iodoform gauze over the raw surfaces to promote drainage and stimulate granulation.

The patient is provided with a small soft-rubber syringe with a metal nozzle and instructed to flush out the spaces between the teeth with warm physi-

ologic salt solution after eating. About a week after the operation the tissues are fairly well healed. The advantages of the procedure are summarized as follows:

1. The morbid tissues are removed at once.
2. Free and efficient drainage is established and the subsequent collection of pus is prevented.
3. The operation consumes comparatively little time and is not painful.
4. It is the only method suitable for those cases in which, in order to avoid secondary infection, sepsis of the mouth must be cleared up prior to a major operation on some other portion or organ of the alimentary tract.
5. The destruction of the periodontal membrane and the absorption of the supporting bone always precedes any deposits upon the roots. After the operation the roots are so exposed that these deposits may be seen and more easily and surely removed.
6. While this operation does not cure pyorrhœa, it obliterates the pocket and infected tissue if the factors producing the disease are removed.
7. It so prepares the field that measures to correct the cause of the condition will have a greater chance for success.

M. N. FEDERSPIEL, M.D.

Da Rocha, F. M.: A Case of Spontaneous Amputation of the Tongue (Um caso de amputação espontânea da língua). *Arch. Rio Grand. de med.*, 1920, ii, 221.

This case was that of a man 33 years of age with a personal and familial history of syphilis. About a year previously salivation had occurred and was followed by a decrease in salivary secretion and hardness at the base of the tongue. The condition ultimately developed into ulcer with final sloughing of the tongue, the tonsils, and the anterior pillars. The local condition then healed up. There was never any hæmorrhage.

The author discusses the usual pathologic processes which may lead to spontaneous amputation of the tongue—tuberculosis, syphilis, malignant tumors, and trophic lesions. The case reported in this article he attributes to a syphilitic thromboarteritis of the lingual vessels.

W. A. BRENNAN.

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INTERNATIONAL ABSTRACT OF SURGERY

SEPTEMBER, 1921

COLLECTIVE REVIEW

GASTROJEJUNAL ULCER¹

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HOLDING to the aim of having this paper reflect, as nearly as possible, the common denominator of the points at issue in considering gastrojejunal ulcer, I wrote to more than a score of men in the States whom I knew to have a large gastro-enterological surgical experience. Many of the quotations and citations of opinions which follow are from these personal communications, thanks for which are hereby publicly acknowledged. Doctor John F. Erdman of New York very kindly sent me his manuscript of a paper entitled "Marginal Gastrojejunal or Peptic Ulcer Subsequent to Gastro-Enterostomy" which he recently read before the New York Surgical Society (16).

FREQUENCY

Realizing the vast number of gastro-enterostomies which have been done in the last two decades, it is most striking to learn that men with clinics in which fairly large numbers of abdominal operations are performed should so rarely see a gastrojejunal ulcer. The two cases of my own experience constitute a high percentage of the total cases seen by me when compared to its infrequent observance by men of extensive practice.

Edward P. Richardson (1) of Boston writes me that he has operated on but four cases; two of these he has reported (2). E. A. Codman (3) of Boston has had two cases. Willy Meyer (4) of New York and Dean Lewis (5) of Chicago each has seen the condition only once. Carl B. Davis (6) of Chicago has had but one case in the last ten years. H. M. Richter (7) of Chicago writes me, "In a fairly considerable experience, includ-

ing approximately thirty gastro-enterostomies on infants, I have not had, or failed to recognize the development of, a single case, and I have somehow never had occasion to operate upon this lesion following gastro-enterostomy by others." W. T. Terry (18) of San Francisco reports three cases from his own practice in four years.

George E. Brewer (9) of New York writes me, "As a matter of fact, I have never in my own practice come in contact with a definite case of open gastrojejunal ulcer secondary to the operation of gastro-enterostomy." Alfred A. Strauss (10) of Chicago writes, "Clinically, I believe that its development does not occur in more than 3 per cent of the cases. I, however, could not make this a definite statement." John B. Deaver (11) of Philadelphia finds that gastrojejunal or secondary ulcers occur in about 2 per cent of cases of gastro-enterostomy. In marked contrast to the last two fairly definite impressions of frequency of occurrence, A. J. Ochsner (12) writes me that his number of gastro-enterostomies well exceeds one thousand but he has met jejunal ulcer, insofar as he knows, in only three cases. He surmised, however, that other patients of his, developing such a complication, may have sought other surgeons.

The frequency of occurrence, as so far stated, is based solely on operative demonstration. This sequela to gastro-enterostomy cannot be limited to the percentage established by operative diagnosis. A sufficiently accurate diagnosis can be reached by pre-operative methods. These indicate very strongly that it occurs rather more frequently than surgeons generally concede.

¹ Read before the Nebraska Section, American College of Surgeons, in session in Omaha, March 3 and 4, 1921.

In April, 1917, Smithies (13) reviewed the condition of 8,826 persons who had been under his observation for some type of digestive disorder. Of this number, 2,360 had been operated upon for gastric or duodenal disease. In his analysis of 273 (11 per cent) of these cases as regards gastric function following gastro-enterostomy he found that only 20.9 per cent were complaint free, while in 87.89 per cent symptomatic or subjective improvement resulted from the operation. The deduction is that 12.11 per cent were suffering from digestive disturbances which, at the time of the re-examination, were equal to, or greater than, those suffered by the patient when originally operated upon. The essentials of this analysis made four years ago are doubtless a fair reckoning parallel for present results. It would seem that if these cases, which were unimproved by operation either immediately or remotely, were averaged with the estimated frequency as established by operative findings, a more accurate opinion or impression would be gained. It certainly cannot be over-estimating the frequency of the condition to assume that within from ten days to ten years following a gastro-enterostomy, jejunal ulcer will develop in at least 8 per cent of the cases under the present surgical technique and non-surgical postoperative care.

ETIOLOGY

Gastro-enterostomy. The constant gross causative factor of gastrojejunal ulcer is a gastro-enterostomy. Primary jejunal ulcer is so rare that it is negligible. Bryan (14) reports a case of primary jejunal ulcer which was undiagnosed throughout a long period of gastro-intestinal disturbance in which there was a crisis of "acute abdomen." Operation was refused for seventeen hours following perforation, and death occurred about twelve hours after the operation. Oviatt (15) says, "Peptic ulcer of the jejunum is rare, usually following the operation of gastrojejunostomy. It has never been reported following the operation of pyloroplasty or gastroduodenostomy for benign conditions." This last statement, made now over ten years ago, is equally true at the present time.

Bacteria. An infective thrombosis or a hæmatogenous infection is doubtless a contributing factor in a small percentage of these complications but certainly not in any such proportion as is directly responsible for the development of the primary gastric or duodenal ulcer.

Syphilis. Erdman (16) was, I believe, the first to call attention to syphilis as a probably strong factor. This assumption is based upon the

microscopic diagnosis of syphilis of three out of five perforating duodenal ulcers which he excised.

Idiosyncrasy. This term was first used with regard to the etiology of gastrojejunal ulcer by Erdman (16). Idiosyncrasy is what Deaver (11) terms "individuality of the patient" and what can be comprehended better as a *constitutional predisposition*. It is exhibited by patients on whom from one to a half dozen laparotomies have been done to relieve them of the tortures of a secondary ulcer. In each instance the obvious ulcer was removed but a new ulcer was formed in the face of the fact that all detectable points of focal infection were cleared, all operative mechanical factors were removed or reduced to the minimum, and reasonable dietetic and alkalinization measures were instituted postoperatively.

The next four causes are distinctly mechanical. The anatomical or mechanical items of gastric blood supply as worked out by Reeves (17) and the grossly ectopic placement of the gastro-entero-anastomosis have been intentionally omitted from this discussion.

Trauma. Operative injury incident to the application of intestinal, hæmostatic, or traction clamps used in gastro-enterostomy must still be tentatively reckoned with as predisposing to marginal jejunal ulcer, but as jejunal ulcer not infrequently follows the non-clamp technique and as the ulcer may be opposite the stoma or slightly distal thereto, it follows that such trauma can be the predisposing factor in only a small percentage of cases.

Blood clot. Like trauma, blood clot may be an occasional cause of marginal ulcer by establishing a circumscribed area of non-protective resistance to infection or gastric juices.

Inaccurate approximation. In the earlier operations and in the hands of varied operators, operative technique lacked much of its present refinement and no doubt non-mucosal tissue was all too often left exposed to the gastric contents. An ulcer then formed which would have been a type of granulating ulcer on any kind of tissue, even if it was entirely protected from all surface irritation or erosion.

Non-absorbable suture material. There seems to be no doubt but that at the Mayo Clinic it was first concluded and the theory was promulgated that silk or linen suture material is the most frequent, if not, in fact, the sole cause of marginal, recurrent, secondary, or gastrojejunal ulcer. This belief arose from, and seemed warranted by, the frequent finding of dangling or exposed non-absorbable material in the new ulcer at secondary operation. The opinion is now generally well

established that it is not advisable to use any material of the non-absorbable type in any row with the possible exception of the re-inforcing suture for the serosa. Even there, iodized or chromic material serves the primary results equally well, and doubtless the end-results better, than either silk or Pagenstecher.

About six or seven years ago Coffey (18) completed a series of experimental intestinal sutures from which he definitely concluded that the presence of non-absorbable suturing material in a secondary ulcer is incidental to the formation of an ulcer rather than its cause. Supporting this view comes the testimony from various sources that gastrojejunal ulcers are found even when only absorbable material was used at the primary operation.

Chemical irritation. While it is true that gastric and duodenal ulcers develop on a mucosa accustomed to constant bathing with gastric juice, it is equally true that alkalization is an essential step for the relief and healing of such an ulcer. It seems fair then to assume that jejunal mucosa, which is accustomed to a constant alkaline contact, would not readily develop tolerance to the acid gastric content. To the jejunal mucosa any acidity is "hyperacidity" and heavily taxes its normal cell behavior. Any cell or group of cells which fails to meet this new physiological diametric demand suffers death, and if the assault to the usual properties of protective repair is sufficiently great, peptic digestion of this group of cells ensues and incipient marginal or jejunal ulcer develops.

The points so strongly crediting the chemical factor as being by far the most potent and most frequent, if not, in point of fact, essential for the formation of ulcer may be epitomized as follows:

1. Neither pyloroplasty nor gastroduodenostomy is followed by secondary ulcer formation in proximity to the operative field or in the jejunum, even in the presence of infection, trauma, blood clot, poor technique, or the employment of non-absorbable suture material.

2. Gastrojejunostomy is the one constant precursor of marginal or complete jejunal ulcer.

3. Gastrojejunal ulcer develops even though detectable focal infection is eradicated, trauma and blood clot are eliminated, refined surgical tissue approximation is observed, and absorbable suture material is used throughout.

4. Postoperative alkalization must be persistently followed as a prophylactic measure against ulcer formation.

Horsley (19), in writing of jejunal ulcer following gastro-enterostomy, says, "The ulceration

may occur where the current of gastric juice strikes the wall of the jejunum opposite the stoma. In such ulcers in a region where the blood supply of the jejunum is unimpaired in any way it seems that no other interpretation can be put on the cause of the ulcer than that it is due to the effect of the gastric juice."

SYMPTOMS

The symptoms do not differ grossly from those of the original ulcer. The digestive disturbances appear early. Abdominal pain, relieved temporarily by food, alkalies, or even copious intakes of water, develops very early if, indeed, it is not the first disturbance to be noticed by the patient. This pain is most always referred to the lower abdomen instead of the epigastrium, as in pyloric ulcer, and is not relieved by position or posture, as is so frequently true of gastric and duodenal ulcers. With this, as with the primary ulcer, there is very constantly, when pain is present, an almost ineffectual desire to belch up gas. The desire to make pressure over the region of the pain, so frequent in the patient suffering from the primary pyloric ulcer, is absent.

SIGNS

The signs of gastrojejunal ulcer are:

1. There is progressive loss of weight.
2. Point tenderness is present but its definition is not as acute as that in cases of pyloric ulcer.
3. Analysis of the gastric contents, as in cases of primary ulcer, is of little help. About twelve years ago Moynihan (20) pointed out that 20 per cent of cases of pyloric ulcer show normal acidity and the remaining 80 per cent are equally divided between subacidity and hyperacidity.
4. Some believe they can elicit a mass by palpation and percussion. I have not been able to do so.
5. X-ray interpretations are disappointing. However, Eusterman (21) believes the X-ray gave either direct or contributory evidence in 65 per cent of the Mayo Clinic cases. As far as I can find, no other clinic seems to have even approached such a degree of accuracy.

COMPLICATIONS

It was also Moynihan (20) who so confidently pointed out that hæmorrhage and perforation are not signs nor symptoms of gastric or duodenal ulcer but are complications and a reflection either upon the attendant in charge of the case or the confidence of the patient in the medical profession. The same holds true of gastrojejunal ulcer.

A few cases of jejunocolonic fistula (9) with its attendant signs of rapid loss of weight, colon content vomitus, and profuse diarrhoea have been reported.

DIAGNOSIS

The history of a gastro-enterostomy and the return of abdominal pain, which is most always hypogastric and relieved by food or alkalies, are practically diagnostic of a gastrojejunal ulcer. The ulcer may develop so soon following the primary operation that the absence of other positive and definite contributory or confirmatory symptoms and signs may be disregarded.

TREATMENT

Like the primary ulcer, gastrojejunal ulcer should be given a thorough opportunity to heal under rigid medical care. If this fails, a surgical return to normalcy should be attempted. A laparotomy should be performed, and if the primary ulcer has healed, the gastro-enterostomy should be obliterated by excising the new ulcer, making an end-to-end jejunostomy, and closing the artificial gastric opening.

Obliteration of the gastro-enterostomy. This procedure is the practice of choice also when the primary ulcer has not entirely healed or a cicatrix remains which produces functional stenosis. The primary ulcer or cicatrix should be excised and if it is in immediate proximity to the pylorus, the opening from its excision should become a part of the step in a Horsley pyloroplasty. If it is found on the anterior surface of the duodenum the opening from its excision should become a step in a gastroduodenostomy.

Reconstruction of the gastro-enterostomy. This should be done: (1) when the primary ulcer is on the posterior wall of the duodenum and still active; (2) when normalcy cannot be established because of bleeding or a stenotic cicatrix in either the pylorus or duodenum; or (3) when inflammatory infiltration is so extensive that plastic work is not warranted and sutures would not hold.

CONCLUSIONS

The conclusions to be drawn with regard to gastrojejunal ulcer may be summarized as follows:

1. Gastrojejunal ulcers are secondary to gastro-enterostomies in approximately 8 per cent of all such operations.

2. Poor adaptability or non-adaptability of the jejunal mucosa to acid gastric contents seems the most constant causative factor.

3. Digestive upsets with vague or severe hypogastric pain which is relieved by food or alkalies must be regarded as the most probable evidence of a gastrojejunal ulcer.

4. A rigid medical régime should be instituted for treatment as well as for prophylaxis.

5. When prudently possible, obliteration of the gastro-enterostomy and a return to normalcy with or without pyloroplasty or gastroduodenostomy or, when this is not feasible, reconstruction of the gastro-enterostomy, offers the best chance for surgical relief.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Burian, F.: Some New Methods of Plastic Surgery (Quelques nouveaux procédés de chirurgie plastiques). *Rev. de chir., Par.*, 1921, lix, 49.

In a case of cancer in which the author had resected the left upper maxilla and almost the entire hard palate he cut a pedunculated strip of skin, fat, and muscle on the same side from the ear to the sterno-clavicular articulation so that the pedicle of the strip was at the ear. He prepared also a strip of the mucosa of the left cheek containing Stenson's duct in its upper part. A horizontal incision was then made across the cheek at the level of the angle of the lips and through this the cutaneous strip was introduced with the epidermis inward and sutured above to the palatal vault and the vestibule of the nose. The bleeding surface of the strip was covered by the strip of mucosa. A very good result was obtained.

In paralysis of the facial nerve none of the usual methods of treatment gives satisfactory results. In order to correct the asymmetry of the mouth and the flaccidity of the cheek Burian combines suspension of the angle of the lips with muscle grafting. To enable the patient to close the eye spontaneously he attaches a thick strip cut from the femoral fascia to the palpebral ligament on one side and to a strip detached from the temporal muscle on the other side.

The author describes also a plastic method of treating lagophthalmia. He fixes a strip of femoral fascia at its center to the palpebral ligament, leads its two ends in channels along the lids, and then fixes the ends to strips cut from the temporal muscle. This method has been applied also to the treatment of cases of complete loss of the lower eyelid.

W. A. BRENNAN.

ASEPTIC AND ANTISEPTIC SURGERY

Landau, H.: Experimental Studies of High Percentage Salt Solutions and Their Use in Infected Wounds (Experimentelle Untersuchungen ueber hochprozentige Kochsalzloesungen mit Beruecksichtigung ihrer Anwendung bei infizierten Wunden). *Arch. f. klin. Chir.*, 1921, cxv, 621.

The author experimented with salt solutions of different concentrations *in vitro* to determine their effect on bacteria and in surgical practice. He used six different concentrations, varying from 1 to 30 per cent, on staphylococci, streptococci, and pyocyanus bacilli.

The action of concentrated salt solutions on pus-producing bacteria was found to be very slight. The 1 and 2 per cent solutions did not kill even the less resistant streptococci or old weakened laboratory strains of staphylococci, much less fresh strains of staphylococci and pyocyanus bacilli. Even after twenty-four hours' action all the micro-organisms were still living.

The 5 per cent solutions were not much more effective, and staphylococci were not killed by twenty-four hours' exposure to a 20 per cent solution. The 30 per cent solution did not kill resistant strains of staphylococci even after twenty-four hours. The pyocyanus bacilli grew after five hours; streptococci, after one hour. Salt solutions therefore have no selective action on pus producers. Even high concentrations cannot be regarded as antiseptic.

Landau's theory of inhibited development did not prove true *in vitro* to any great extent. Tables are given showing the results. In spite of his poor results *in vitro*, however, he made a series of experiments on white mice to determine the action of hypertonic salt solution in the animal body. Not a single animal was saved by the salt solution. Not even any difference in time was noted between the deaths of the animals treated with salt solution and those of the control animals.

Unlike Rogge, Landau found that even very concentrated salt solutions have only a very slight bactericidal action in the animal body and that chemical antiseptics cannot be procured with them. He is very skeptical even with reference to mechanical antiseptics. He states that it may be possible to remove some of the micro-organisms from the wound by irrigation or other mechanical means, but those which remain are sufficient to maintain the infection and suppuration. The most important factors in controlling suppuration are experience and care on the part of the surgeon.

CREITE (Z).

ANÆSTHESIA

Kappis, M.: The Prevention of the Unfavorable Effects of Local Anæsthesia (Wie vermeidet man die Gefahren der Lokalanæsthesie?). *Med. Klin.*, 1921, xvii, 187.

In addition to the general disturbances caused by novocaine absorption, which may take place from any part of the body, there are other possible dangers due to the action of novocaine-suprarenalin solution on organs which are indispensable or to the injection of this solution into the blood vessels or dura.

Haertel's method of anæsthetizing the trigeminus overcomes the difficulties possible in the anæsthesia of that nerve. In lumbar anæsthesia Hosemann's method should be followed, and in sacral anæsthesia, Laewen's method, not over 20 c.cm. of a 2 per cent novocaine solution being used. High sacral anæsthesia should be avoided.

For anæsthesia of the neck the injection should not be made near the great vessels or the notches of the spinal column. At the level of the angle of the jaw or hyoid bone it is of no consequence whether the injection is made directly from the side (Haertel, Geiger) or posterolaterally at the transverse process. Both routes (Kappis) lead only through muscle. The side of the transverse process having been reached — one should not go beyond the anterior edge of it — 15 c.cm. of a $\frac{1}{2}$ per cent novocaine solution are injected. The skin near the incision may be injected to decrease bleeding. Deep injections should not be made and moreover are superfluous. In plexus anæsthesia care must be taken to avoid injuring the pleura. This is possible in injection according to Kulenkampff's method as well as in the more peripheral method recommended by Hirschel.

The patient should lie on his back, his head turned toward the side and inclined forward. The needle must be inserted in a frontal direction downward toward the first rib, that is, parallel to the pleura rather than toward it. From the first rib the plexus is located by pushing the needle toward the side or the midline, never backward into the

deep tissues. Permanent paralysis is avoided by the use of small needles, care in locating the plexus, and slow injection. In paravertebral anæsthesia and splanchnicus anæsthesia induced by Kappis' method injections into the vessels or the dura and too quick absorption in the epidural tissues can be easily avoided by suction with the syringe, pressing or coughing by the patient, slow injection, and the use of small quantities of a solution as weak as possible, not stronger than $\frac{1}{2}$ per cent.

The author seldom uses paravertebral anæsthesia except in thoracoplasty. Complete absence of pain and danger is best obtained by injecting in two stages. First the region of the incision should be injected down to the ribs with a $\frac{1}{4}$ to $\frac{1}{2}$ per cent solution and after the intercostal spaces have been laid bare a $\frac{1}{2}$ per cent solution should be injected along the lower border of the rib.

In kidney operations the author first injects the site of the incision locally, and then from the open wound injects the splanchnic nerves of the side involved, the fatty capsule of the kidney, especially in the direction of the kidney pedicle, and the dome of the diaphragm. There are no dangers in Braun's method of splanchnic anæsthesia. In the author's method the dangers can be avoided by inserting the needle below the twelfth rib, about a hand's breadth from the midline, passing it into the deep tissues at the side of the spinal column to its anterior border and a little upward, and then injecting 25 to 30 c.cm. of a $\frac{1}{2}$ per cent solution at this point on each side.

TROMP (Z).

SURGERY OF THE HEAD AND NECK

HEAD

Demmer, F.: *The Pathology and Treatment of Concussion and Lesions of the Brain, with a Report on the Immediate and End-Results of Closed Injuries of the Brain and Treatment by Tampon and Lumbar Puncture* (Zur Pathologie und Therapie der Commotio und Leasio cerebri, zugleich ein Bericht ueber die Frueh- und Spaetresultate der geschlossenen Wundbehandlung im Gehirn und der Behandlung mit dem Tampon und der Lumbalpunktion). *Beitr. z. klin. Chir.*, 1921, cxxi, 491.

This article reports the results of treatment in 255 cases of gunshot injury of the skull and brain treated at the Hohenegg clinic from 1910 to 1914. Most of the injuries were due to attempted suicide or war missiles.

The cases of war wounds were under the author's care at the front and then sent to the base hospital at Vienna where he had an opportunity to examine them again later. He believes the loss of consciousness for varying periods of time in concussion of the brain is due to a primary injury of the blood-vessels followed by transudation. There may be temporary œdema of certain centers causing brief loss of consciousness or general hydrops and in-

creased pressure over the whole brain resulting in prolonged loss of consciousness.

Injuries of the base may affect the medulla and the floor of the fourth ventricle and cause concussion either by directly affecting the center of consciousness or by causing transudation. The most serious form of closed injury of the skull is that in which there is splintering of the inner table with local or general compression and concussion without visible injury. In such cases there was always marked external hydrocephalus. The latter was favorably affected by lumbar puncture. Lumbar puncture is of value also in the prognosis as bloody fluid indicates a grave condition. If there is a serious clinical picture but puncture does not show pressure, shock of the medulla is indicated. In the treatment of injuries of the brain, prolapse and softening of the brain must be taken into consideration.

The question of primary closure of skull wounds caused lively discussion throughout the war. Of 67 brain injuries, 11 were treated by wound excision, a plastic fascia operation, and primary suture. Of these 11 patients, 8 are living three years later. In 22 cases of primary closure of brain wounds it was necessary to reopen the wound later in 8 cases

because of the formation of an abscess. Every brain injury should therefore be regarded as infected. In all cases in which primary suture was done it was followed by an increase in brain pressure. The author recommends a control puncture in the region of the injury after one hundred days, even in cases which progress favorably. Albrecht recommends tampon treatment and lumbar puncture. If lumbar puncture is ineffective on account of adhesions of the dura or clots, puncture of the corpus callosum or suboccipital drainage is used. Prolapse was never observed in treatment by lumbar puncture.

Thirty-nine cases were treated with good results. The wound was enlarged without using a chisel, the bullet removed, a damp, compressible tampon inserted by Mikulicz' method, and a stiff, unremovable bandage applied. The operation was performed under chloroform anæsthesia. The first tampon was left in for twelve days. Lumbar puncture was used to prevent prolapse of the brain. The indications for lumbar puncture are symptoms of brain pressure, collapse and a tendency of the wound to prolapse when the tampons are changed, threatened perforation, and the symptoms of meningitis. In perforation 10 c.cm. of a $\frac{1}{2}$ to 1 per cent collargol solution were injected every day by lumbar puncture and from 15 to 80 c.cm. of spinal fluid were removed.

A comparison of primary suture with open tampon treatment and lumbar puncture favors the latter. The latter can be used also where primary suture would be impossible; good results have been obtained even in cases of progressive encephalitis and perforation of the ventricles.

VORSCHUETZ (Z).

Imre, J., Jr.: New Principles in Plastic Operations of the Eyelids and Face. *J. Am. M. Ass.*, 1921, lxxvi, 1293.

The author reports a series of excellent results he has obtained by means of plastic surgery. He has performed several hundred operations to correct disfigurement due to war injuries. All were done

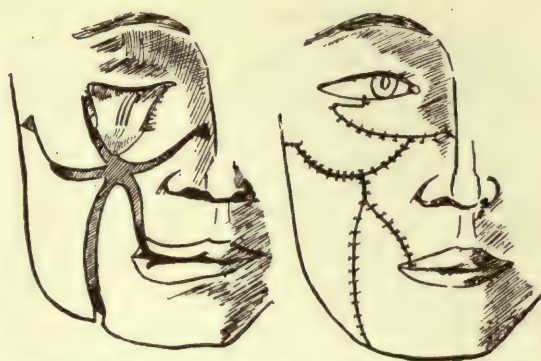


Fig. 3. Method of removing deep scar tissue; small flaps were slid into place; sutures.

under local anæsthesia (2 per cent procaine with 6 drops of epinephrin to every 10 c.cm. of the solution). He employs free cutaneous grafting only in defects of the skin of the upper eyelid when scars or other defects make it impossible to obtain a flap from the temporal region. He generally avoids free grafting on the lower lid because the concavity of the base may cause a horizontal wrinkle and result in an ugly ectropion.

In cases of new growths of the lower lid or the nasal or temporal corner of the eyelid he covers the defect with skin from the immediate neighborhood without the formation of a real pedunculated flap. In order to slide the greatest amount of skin causing the shortest possible wound, he makes a curved incision and slides the tissue used for covering the defect in a bow. Figs. 1 and 2 illustrate the application of this principle. The curved incision should have the form of a quarter ellipse and should be about four times as long as the length of the necessary sliding. At the end, a small triangle of skin is removed to facilitate the sliding and to prevent the formation of wrinkles. Subcutaneous mobilization is of the utmost importance.

In cases in which the defect in the fat and fascia is greater, Imre employs pedunculated flaps or flaps of fat and fascia. In cases of still more extensive defects it is frequently necessary to insert a few catgut sutures to fix the flap units in place.

FREDERICK CHRISTOPHER, M.D.

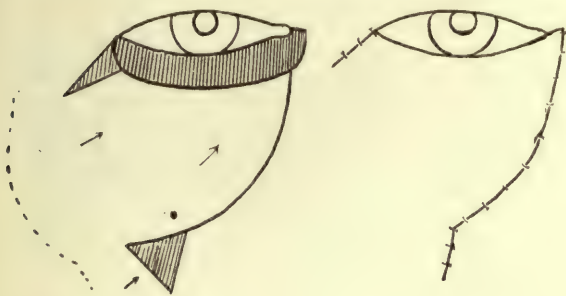


Fig. 1. The arrows show the manner in which the flaps were slid.

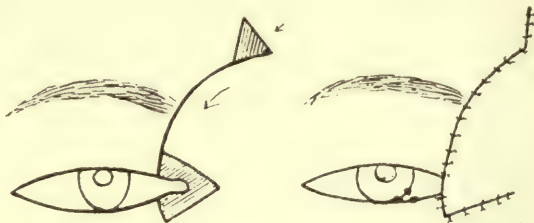


Fig. 2. A single sliding flap was employed for this purpose.

Pólya, E.: An Operation for the Correction of Certain Lateral Defects of the Soft Parts and Tip of the Nose (Verfahren zum Ersatz von gewissen lateralen Defekten der Weichteilnase und der Nasenspitze). *Zentralbl. f. Chir.*, 1921, xlviii, 257.

Following the suggestion of Mutter and Zuckerkandl, Pólya makes a flap from the skin of the cheek beside the nose. This forms a fold at the nostril which can be avoided only by cutting out a Burow triangle. Pólya, however, does not cut this triangle off but uses it to line the nose flap. The steps of his operation are as follows:

1. The defect is trimmed so that it is triangular in shape.
2. A V-shaped incision is made at the nasolabial sulcus. The apex of the V is downward, and the distance between its upper ends is as great as the width of the nasal defect.
3. The skin flap, the lateral edges of the nose defect, and the neighboring skin of the cheek are freed from the underlying tissues so that the edges of the triangular defect in the nose can be brought together in the midline without tension.
4. The secondary defect is sutured along the nasolabial fold.
5. The triangular flap is turned back into the nose and sutured to the wound in the nasal mucous membrane.
6. The wound edges of the nasal defect are sutured perpendicularly. RAESCHKE (Z).

Dufourmentel, L.: The Surgical Treatment of Prognathism (Le traitement chirurgical du prognathisme). *Presse méd.*, Par., 1921, xxix, 235.

There are true and false forms of prognathism. In one form of true prognathism the lower jaw is too long and too massive as in persons with acromegaly, the angle of the mandible is too open, and the lower incisors project from 1 to 1½ cm. in front of the upper incisors. This is a congenital condition.

In another form the lower jaw is normal in shape, but projects forward because of an old and irreducible dislocation of the temporomaxillary joint. In this form the condyles are atrophied.

The forms of false prognathism are of dental origin and can be corrected by prosthetic or dental treatment. Heretofore the only operation for true prognathism has been bilateral resection of the lower maxilla in the region of the angle of the jaw or the posterior part of the body. This operation is difficult, mutilating, and serious as it involves a double fracture of the inferior maxillary bone in communication with the mouth cavity and the loss of two or three teeth on each side. The inferior dental nerves and vessels being cut, the vitality of the rest of the maxilla and of the remaining teeth is lowered. In addition, difficult after-treatment is necessary and there is danger of a double pseudarthrosis.

Since 1917 the author has operated on five cases of marked prognathism by double resection of the

condyles. He believes this is the best operation for all cases of prognathism which cannot be corrected by dental treatment. It is not serious and if carefully done there are no complications. Of course it should be performed under the strictest asepsis. As it does not constitute a fracture, no consolidation is necessary after it. There is no ankylosis as the articular surface remains intact, and there is no scar formation. It does not decrease the force or amplitude of the movements of the jaw. It merely decreases the length of the bone so that it is drawn back. The scar is hidden under the hair. The technique is as follows:

A V-shaped incision is made with the point downward. The posterior branch, which is vertical just in front of the meatus of the ear, is about 3 cm. long and ends just in front of the tragus. From this point the anterior branch, which is also 3 cm. long, runs upward obliquely toward the temple. This incision is made well above the neck of the condyle. The tissues are pushed down gradually with a tractor in order to protect the parotid and the facial nerve. This part of the operation demands great care.

After the condyle is exposed the neck is cut with a Gigli saw or is removed bit by bit with a cutting forceps. As soon as the condyles have been removed on both sides the maxilla is pushed back to correct the prognathism. It is generally necessary to apply forceps to the pericondylar veins to control hæmorrhage. After these veins have been ligated the wound is usually closed without drainage, but in some cases a drain is left in for twenty-four or forty-eight hours.

When the operation is finished the ramus rises so that the incisors cannot be brought together but the author believes this will probably correct itself in time, as it did in one case in which no appliance could be used on account of the absence of the upper teeth. Correction is effected more surely and quickly by the use of an appliance to hold the jaw in position. This can be dispensed with after about four weeks. A. G. MORGAN, M.D.

Aloi, V.: A Case of Giant-Cell Sarcoma of the Tongue (Un caso di sarcoma a mieloplasi della lingua). *Riforma med.* 1921, xxxviii, 219.

Sarcoma of the tongue is rare as compared with carcinoma. The author describes the case of a man of 41. The condition had begun a year and a half previously with a roughening of the right border of the tongue which finally ulcerated. Treatment with mercury was given. In about two months a tumor began to form, and at the time the patient was examined by Aloi, he was unable to close his mouth, experienced difficulty in swallowing, and suffered great pain. The submaxillary and lateral cervical glands were involved. A section of the tumor was removed for examination. It was too late for operation. The patient died a month and a half later.

Histologic examination showed many round and fusiform cells in a connective-tissue stroma which

was irregularly alveolar in type. There were also large cells with many nuclei which on superficial examination resembled giant cells with the nuclei undergoing karyokinesis. The nuclei, however, were degenerating, and the protoplasm also showed vacuolar degeneration and plasmolysis. These myeloplaxes are derived from periosteum. In some areas in the tumor they were abundant, in others rare or absent. The parts of the tumor where there were few myeloplaxes were very vascular, giving it the appearance of an angioma. Such a tumor may be confused with gumma, actinomycosis, inflammatory infiltration around a foreign body, a retention cyst, fibroma, or endothelioma.

The author discusses the differential diagnosis and emphasizes the importance of early excision without waiting for the results of medical treatment. The patient whose case is reported might have been cured if excision had been done when the mercury treatment was first begun.

Different explanations have been given for the origin of these tumors, but the author believes they are embryonic, developing from misplaced foetal rests of the alveolar periosteum of the lower jaw. In fact, they are sometimes called "sarcomatous epulis."

A. G. MORGAN, M.D.

NECK

Paterno, A.: Cystic Lymphangioma of the Neck
(Linfangioma cistico del collo). *Clin. chir.*, 1920, n.s. ii, 906.

The author describes a case of cystic lymphangioma of the neck in a girl 21 years of age. The patient had always been in good health and her family history also was negative. Two years previously she had noticed a lump about the size of a nut in the left supraclavicular fossa. Her physician punctured it and injected tincture of iodine. This treatment, which caused severe pain and an inflammatory reaction, was continued for a month but since then nothing further had been done.

When the patient was admitted to the hospital the tumor filled the supraclavicular fossa and extended upward to the level of the cricoid cartilage. It was as large as the head of a fetus. The entire sac of the cyst was extirpated. Recovery was prompt and more than a year afterward there was not the slightest sign of recurrence.

The cyst was unilocular. Trabeculae extended inward for some distance from the walls, but did not meet at any point. The cyst cavity was lined with simple pavement endothelium which was of the same type as that normally lining lymphatic vessels and rested on a connective-tissue base. The connective-tissue layer of the cyst wall was penetrated by numerous very small blood and lymph vessels. There was no small-cell infiltration around them. In some areas there were bands of endothelial cells around a central lumen which resembled newly-formed lymphatic vessels. The histologic appearance of the tumor is shown by three photomicrographs.

The author takes up in detail the discussion in the literature regarding the origin of cystic lymphangioma. Some authors hold that they are primarily angioma which lose their connection with the blood vessels and are transformed into serous cysts secondarily. Paterno believes that they are lymphatic in origin, and in support of this theory cites the fact that they often appear in conjunction with macroglossia and macrocheilia and the structure of lingual lymphangioma is the same as that of the walls of cystic lymphangioma of the neck. He refers to the detailed histologic description of the cells in the case reported in this article as evidence of their lymphatic origin. Such origin is indicated also by the intimate relationship between the cyst cavity and the lymphatic vessels of the region.

Some authors regard these cysts as due merely to dilatation of lymphatic spaces and vessels, while according to others, including Paterno, they are true neoplasms. Paterno believes that the appearance of the cells in his case shows a true new-formation of lymphatic vessels by the proliferation of endothelial cells and that such cysts originate in misplaced embryonic cells. He states that sometimes they begin in foetal life and that cases have been known in which they offered a serious obstacle to parturition. In cases like his own, however, in which the cyst did not develop until adult life, the embryonic cells have for some unknown reason remained latent for years, and then, for an equally unknown reason, begin to proliferate. Sometimes proliferation is initiated by inflammation or trauma, but in the case herein reported neither of these had been a factor.

Some authors attribute great importance to heredity or to tubercular lesions in the development of such cysts, but though these have seemed responsible in some cases, Paterno believes they were merely coincidences, as in a study of a number of case reports in the literature he found no mention of tuberculosis or a hereditary tendency.

The sites of election for cystic lymphangioma, as for angioma, are the neck, the axilla, and the inguinal region, that is, the areas in which during embryonic life there is the greatest activity in the formation of tissue.

These tumors do not show any tendency to invade neighboring organs but generally form intimate relations with the vessel sheaths, cases having been observed in which the sheath of the internal jugular or the subclavian formed part of the cyst wall. This often makes it difficult or impossible to resect the cyst completely. As a rule nerves are not involved in the tumors.

The diagnosis is generally easy, especially when the tumor lies just beneath the skin and is fluctuating and semi-transparent. Sometimes when it is deeper it may be confused with a lipoma but the latter is firmer and does not change in size or appearance with a change of position. In other cases it may be confused with a cystic goiter, but a goiter has a more median position, is of slower growth,

and does not show any tendency to form prolongations into neighboring muscles. Cystic lymphangiomas may be differentiated from branchiogenous cysts, cold abscesses, and cavernous angiomas by exploratory puncture. There may be prolongations of the cyst into the mediastinum giving rise to special symptoms.

The prognosis is good. There is little or no danger of recurrence, even after only partial extirpation. In the subcutaneous forms there may be necrosis which leaves the cyst open and gives issue to a discharge of lymph, but this can be remedied by excision. Puncture, compression, the injection of remedies such as iodine, simple incision, and electrical treatment have not given very satisfactory results.

The best treatment is complete excision. If this is impossible on account of intimate adhesion to large vessels, partial excision is effective. In some cases of partial excision the edges of the remaining part of the cyst have been sutured into the skin wound, but this has not given results much better than those of simple partial excision with closure of the skin wound.

The author gives a review of 21 cases from the literature in tabulated form and a bibliography of 137 titles.

A. G. MORGAN, M.D.

Levin, S.: One Thousand, One Hundred and Forty-Six Goiters in 1,783 Persons. *Arch. Int. Med.*, 1921, xxvii, 421.

Levin examined 1,783 persons in the Great Lakes goiter belt in regard to enlargements of the thyroid. In this region there are three distinct water supplies: spring water from the Gregory Springs, Lake Superior water, and well water. It was found that the incidence of the different types of goiter at the various ages and in the two sexes was the same whatever the water supply.

The thyroid was found to be enlarged in 1,146 persons. Of these, 682 had simple goiters; 420, adenomata and cystomata; and 44, colloid goiters.

The goiter begins at the first year in about 22 to 26 per cent of the cases and the percentages increase

rapidly toward puberty, when the incidence is about 94 per cent in the female and 68 per cent in the male. In the female the incidence is maintained above 80 per cent throughout life. In the male it drops very markedly to about 20 per cent between the ages of 35 and 40, then rises slightly at 42, and finally falls again, with accidental fluctuations, until 20 per cent is reached near the end of life.

In the female the change and growth of the thyroid are greater than in the male because of the greater demands on the glands of internal secretion at puberty, during the child-bearing period, and at the menopause. Up to the thirty-fifth year of life in both sexes goiters are due to simple enlargement of the gland, but as the age arrives when neoplasms are more prevalent, the adenomata and cystadenomata maintain the percentage. The author's curves show that puberty affects the growth of simple goiter earlier than the enlargement of the adenomatous masses.

In families with four or more children it was found that when both parents have a goiter the incidence of goiter among the children is high. Adenomata in both parents, and especially in the father, meant adenoma in the children which undoubtedly will develop into goiter if they continue to live in a goiter belt. The influences which cause an enlarging, active thyroid in the mother are carried through the placenta and cause a corresponding enlargement of the foetal thyroid. These are chemical in nature and act positively or negatively. A fact proving that the transmitted influence passes through the placenta rather than the mammary secretion is that enlargement of the foetal thyroid disappears in from seven to fourteen days after birth, even though the child is nursed by its mother.

Enlargement of the thyroid maintained by living continuously in goiter belts will be permanent. Such glands can be treated only by surgical intervention. This applies more directly to adenomata which have the potentiality of varying in size and becoming plain tumor masses and thyrotoxic.

M. H. KAHN, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Mozingo, A. E.: The Surgical Treatment of Empyema by a Closed Method. *Am. J. M. Sc.*, 1921, clxi, 676.

Attention is called to the fact that the mortality from empyema in the various army camps during the winter of 1917-1918 was 30.2 per cent. Lillenthal has stated that a mortality lower than 25 per cent in acute empyema may be considered good. Mozingo reports 45 acute and 93 chronic cases treated by him at the Walter Reed General Hospital and the base hospital at Camp Pike, Arkansas, in which the mortality was less than 2 per cent.

Reports have been received from 80 per cent of the patients and there have been no recurrences. The method used by Mozingo in acute cases is as follows:

With local or with no anæsthesia a stab incision 5 mm. long is made in the eighth interspace in the postaxillary line and a trocar with a sharp point and a cannula which will just admit a Carrel tube are inserted. The trocar is then withdrawn, the rubber tube inserted, and the cannula withdrawn. The tube has from five to ten fenestræ 3 mm. in diameter and 1 cm. apart. About 6 in. of tube lie within the chest cavity and about 6 in. outside. The tube is thus held air-tight. It is connected with an aspira-

tor or aspiration is effected by means of a bulb syringe. The ordinary dressing is placed around the tube at the site of puncture and between aspirations a sterile rubber bulb is placed over the end. In serious cases the cavity is irrigated with saline solution but in ordinary cases Dakin's solution is employed. No air is permitted to enter the chest cavity.

After aspiration of the secretion, from 50 to 200 c. cm. of Dakin's solution are injected, agitated, and aspirated, this process being repeated until the return fluid is clear. A quantity of Dakin's solution equal to about one-fifth the original capacity of the cavity is then injected and allowed to remain from five to thirty minutes. At the end of this time it is aspirated and the maximum negative pressure re-established. This procedure is repeated every three to five hours by day and once or twice during the night. In subacute cases it is done oftener, and in serious cases, less frequently.

The treatment is begun as soon as fluid is revealed by diagnostic puncture and regardless of the type of pneumonia or the patient's condition. Mozingo does not mention the exact strength of the sodium hypochlorite solution employed but states that the various commercial preparations are satisfactory. After from four to ten days, or when the secretion is sterile or nearly sterile, he injects a twenty-four-hour-old 2 per cent solution of liquor formaldehyde in glycerin once daily. The amounts vary from 5 c. cm. in the beginning to 15 c. cm. later, and the injection is preceded by the usual treatment with the sodium hypochlorite solution. The advantages of the formaldehyde are that it sterilizes the cavity, permits the removal of the tube, causes little discomfort or loss of sleep, renders the secretion sterile, and is readily absorbed. Moreover, the cavity develops a tolerance for the antiseptic left in the cavity when the tube is removed. When the smears and cultures are negative the tube is removed as follows:

The skin is cleansed with ether, an iodine swab is inserted around the tube, from 5 to 10 c. cm. of formaldehyde solution are injected into the cavity, the tube is removed, the iodine swab is re-inserted into the sinus, and the sinus is closed with adhesive. If there is a recurrence of secretion containing organisms, the process is repeated.

The author insists upon exercise in the uncomplicated cases and gives an abundance of food, using the appetite as a guide. Exercise is maintained by means of Wolfe bottles and Naunyn's plan of having the patient sit in a chair with the well side against the arm, in which position the breathing exercises cause expansion of the diseased side.

If in chronic cases secondary to and following open operation the sinus is narrow or the cavity so small that negative pressure is not necessary, irrigations with Dakin's solution are followed by injections of the formaldehyde solution. In cases in which there are larger cavities a tube which fits the sinus snugly is used and the treatment described is applied more vigorously than in the acute cases.

If a secondary open operation is necessary, the treatment described is given after the wound is closed air tight. The author states that those who are loudest in their condemnation of Dakin's solution are those who are most ignorant of its use.

ROSCOE C. WEBB, M.D.

Turner, P., and Mandel, L.: Submammary Tumor of the Chest Wall. *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Clin. Sect., 60.

The authors report the case of a woman 46 years of age who, eight years previous to the examination, had suffered a blow on the right chest which fractured had three ribs. While subsequently she had always felt some irregularity beneath the right breast, it was not until two or three months before her admission to the hospital that the breast began to enlarge and a hard lump became palpable.

Examination showed a firm lobulated swelling about the size of a fist which was adherent to the chest wall by a broad attachment. The X-ray showed calcification of the tumor but no erosion of the ribs. At operation the growth was found to extend considerably into the thoracic cavity. It was excised with portions of three ribs. Histologically it proved to be a chondroma. The patient recovered.

FREDERICK CHRISTOPHER, M.D.

TRACHEA AND LUNGS

Theis Eden, R.: Plugging of the Lung with Animal Fat (Lungenplombierung mit tierischem Fett). *Deutsche med. Wchnschr.*, 1920, xlvii, 1017.

The author studied by experiments on rabbits the behavior of oil obtained from human fat when injected into the pleural cavity. He reports the findings noted after the fat had remained in the cavity for varying periods of time. Resorption almost never occurred. On the contrary, the fat became organized into a soft mass. The borders of this mass were gradually separated from the pleura by a delicate adipose tissue while its center retained the soft fat-like character. The fat adhered to the pleura in a layer about 2 cm. thick.

No disturbance such as pleural irritation was noted. In the single clinical case in which the author injected the oil the result was unfavorable but this could not be ascribed to the treatment.

The author hopes that extrapleural as well as intrapleural injection of the lung will be found applicable in the treatment of tuberculosis as well as bronchiectasis. Further research and the application of the method to clinical cases is desirable.

VORSCHUETZ (Z).

HEART AND VASCULAR SYSTEM

Klose, H.: The Regeneration of Heart Muscle in Wounds (Ueber die Regeneration des Herzmuskels in Wunden). *Beitr. z. klin. Chir.*, 1920, cxxi, 220.

From his own experimental work and that of others the author comes to the following conclusions:

In open wounds the heart muscle shows no true regeneration. The gap is filled up with cicatricial tissue. The formation of the scar in heart muscle proceeds from the scanty stroma of the myocardium. Necroses persist in the cicatricial tissue for a long time. The scar is not firm enough to be anatomically satisfactory until after the lapse of several months. The functional result depends on the location of the wound and its course and length. Catgut sutures cause a much more pronounced chemical reaction in heart muscle than silk sutures. Wounds sutured with silk heal after about four weeks with almost no connective-tissue reaction. Heart muscle should be sutured only with permanent suture materials, preferably interrupted sutures of silk.

HAECKER (Z).

PHARYNX AND OESOPHAGUS

Reynolds, R. P., and Morrison, W. W.: Congenital Malformations of the Oesophagus, with a Report of Two Cases. *Am. J. Dis. Child.*, 1921, xxi, 339.

Reynolds and Morrison report two cases of congenital malformations of the oesophagus in infants 5 days old.

The clinical picture is very definite and the diagnosis comparatively simple. The child is apparently healthy and swallows liquid readily, but regurgitation occurs in from one to three minutes after swallowing. On taking food, the child becomes cyanotic, often coughs violently and makes gurgling noises, and the vomitus is foamy and alkaline or amphoteric in reaction.

These suffocative attacks are repeated at every attempt to take food. If the patient lives a few days, mechanical dilatation of the upper sac may occur and a few teaspoonfuls of fluid may be retained, but as soon as the sac is full the reflex phenomena recur. A catheter passed into the oesophagus under the fluoroscope makes the diagnosis certain.

In the matter of treatment the only means by which the child's life may be saved is a gastrostomy performed as soon as the condition is diagnosed. The technique may be difficult as the liver may be large and the stomach contracted. In some cases, however, the stomach may be ballooned out with gas. Even if the operation is successful, death may result from aspiration pneumonia due to regurgitation of stomach contents through the tracheo-oesophageal fistula into the lungs.

Death occurred in both of the cases reported. At autopsy in one case the oesophagus was found to be patent as far as the level of the fourth dorsal vertebra, where it ended blindly in a dilated pouch. This pouch was situated just at the bifurcation of the trachea and just above the arch of the aorta. From this point the oesophagus was represented by a fibrous band to within an inch of the stomach, where it again became a patent tube emptying into the stomach.

H. A. MCKNIGHT, M.D.

Hirsch, I. S.: Congenital Atresia of the Oesophagus: Report of Two Cases. *J. Am. M. Ass.*, 1921, lxxvi, 1491.

The rarity of congenital atresia of the oesophagus and its interesting variations make of interest the report of two cases of this unusual anomaly.

One case was that of a female infant admitted to Bellevue Hospital, New York City, from the School of Midwives, with a diagnosis of pyloric stenosis. Food was taken with great eagerness but promptly vomited, and only meconium had been passed by bowel. A soft catheter introduced during the fluoroscopic examination did not pass beyond a point above the level of the arch of the aorta. Gastrostomy was performed, but the infant died four hours after the operation.

At autopsy, congenital atresia of the oesophagus was found. There was no postoperative hæmorrhage into the abdomen. Uric acid infarction had occurred in the kidneys. The alimentary canal from the cardiac end of the stomach to the anus was patent throughout. The oesophagus was patent to the level of the fourth dorsal vertebra, but ended at this point in a blind pouch. Beyond, it was continued as a fibrous band to within 1 in. of the stomach where it again became a patent tube.

The other case was that of a male infant which lived 3 days. The child vomited all food and passed only meconium by bowel. There was no palpable mass in the abdomen and there were no asphyxial attacks. A catheter could be passed into the oesophagus for a distance of only 4 in. from the gum margin. Roentgen examination revealed the presence of a dilatation of the oesophagus at a point just above the arch of the aorta. Immediately after the sac reached its full distention the bronchial tree became outlined. There was severe coughing followed by the expulsion of some of the bolus. The trachea and large and small bronchi were thus clearly outlined through a fistula by which the oesophagus communicated with the trachea near the bifurcation. Gastrostomy was performed, but the child died the next day. An autopsy was not performed.

A review of the literature shows that in 96 out of 136 collected cases an oesophagotracheal fistula was found. The incidence of the anomaly is the same in both sexes. Other anomalies are frequently discovered, the most common being atresia and which was noted in 24 cases.

It is now generally conceded that congenital atresia of the oesophagus is due to faulty development rather than an intra-uterine inflammatory process as was at one time believed. Kiebel and Mall state that for the formation of the common type of this anomaly failure in development of the lower portion of the tracheo-oesophageal septum which leaves the oesophagus in communication with the trachea is essential.

The most common form is a blind sac, a lower sac opening into the trachea above the bifurcation; 70 per cent are of this type. G. HAVEN MANKIN, M.D.

Jackson, C.: *The Symptomatology and Diagnosis of Foreign Bodies in the Air and Food Passages, Based on a Study of 789 Cases.* *Am. J. M. Sc.*, 1921, clxi, 624.

The factor most frequently responsible for the failure to determine the presence of a foreign body in the lung is the almost total absence of symptoms during the first few days or weeks. In the majority of cases a history of varying degrees of irritation, spasm, or obstruction of the larynx at the time of the aspiration of a foreign body is given, but in a considerable number the foreign body passes through the larynx so quickly and easily that it causes no irritation.

Foreign bodies in the larynx usually produce cough which as a rule subsides after a short time. Stridor and hoarseness frequently persist. In most cases the reaction and swelling of the larynx render the condition acute and necessitate intervention. Movable foreign bodies should be thought of if the symptoms recur. The patient usually feels the presence of the foreign body and often there is pain near the "Adam's apple" or referred to one or both ears. Odynophagia may occur when the arytenoid region is affected. Impairment of phonation and dyspnoea vary with the size of the foreign body. Fever is rare unless there is a perichondritis. In infants the diagnosis of laryngeal foreign bodies depends greatly upon the history and in every suspected case a roentgenological study should be made. Diphtheria is often confused with this condition and when there is doubt antitoxin should be administered. A definite diagnosis can be made by mirror laryngoscopy in the cases of adults and with the direct laryngoscope in the cases of children.

Foreign bodies in the trachea are usually small enough to pass the glottic chink but too large to enter either main bronchus. The glottic chink is smaller than the tracheal lumen. As a rule there is a history of an initial spasm followed by wheezing respiration and a cough. The foreign body may be heard flapping in the trachea, and the patient may feel these movements. The consequent swelling causes increasing dyspnoea and a powerful cough may force the foreign body up to the cords and jam it there, causing asphyxia. Pointed foreign bodies may cause pain. Sudden shutting off of the respiratory blast during coughing is pathognomonic of tracheal foreign bodies.

In cases of foreign bodies in the bronchi a history of initial laryngeal spasm is usually given. Following this spasm in the cases of young children a diffuse laryngo-tracheo-bronchitis develops within twenty-four hours and is accompanied by fever, toxæmia, cyanosis, dyspnoea, and paroxysmal cough. If the child does not drown in its own secretions a lung abscess rapidly forms. In older children the reaction is less severe. In the early stages there is an acute obstructive emphysema.

Bronchial foreign bodies which have been present for some time often give no sensation at the time of

inhalation. After a varying interval cough and expectoration result and the patient usually presents all the symptoms of tuberculosis. The expulsion at times of large amounts of foul-smelling purulent material is so nearly diagnostic of foreign body that it should be looked for. Pain may occur at the site of the foreign body. Certain foreign bodies may be tasted in the sputum. Sudden complete obstruction of one bronchus does not cause noticeable dyspnoea but is followed by a rapid onset of symptoms. The author states that the pleura is rarely involved and in only one of his cases was pus revealed by rib resection. Limitation of expansion on the affected side, impairment of percussion, and diminished breath sounds distal to the foreign body are usually noted. All patients with chest diseases should have the benefit of a radiographic study to exclude foreign body.

Esophageal foreign bodies have no absolutely diagnostic symptoms. Dysphagia is the most constant complaint. Sharp foreign bodies often cause pain. The subjective sensation of a foreign body cannot be relied upon as it remains after the passage of the intruder. Antero-posterior and lateral radiographs should be taken and retaken after the removal of a foreign body. Foreign bodies which are not radio-opaque may be revealed by fluoroscopic study. Attempts at removal with or without the presence of a foreign body may give the subjective symptoms.

Gastric foreign bodies ordinarily produce no symptoms. In such cases the chief means of diagnosis are radiographic and fluoroscopic studies.

ROSCOE C. WEBB, M.D.

MISCELLANEOUS

Young, J. R.: *Abscess of the Posterior Mediastinum, with a Case Report.* *J. South Carolina M. Ass.*, 1921, xvii, 111.

Abscess formation in the mediastinum is probably more common than was formerly believed. The X-ray is an indispensable aid in the diagnosis. Surgical intervention is practicable and offers the best chance of recovery.

The etiology of this condition is variable. It may be caused by retropharyngeal abscesses, caries of a cervical or high dorsal vertebra or of the sternum, ruptured ulcer of the œsophagus, or pneumonia.

The symptoms are divided into two groups: (1) pressure symptoms, and (2) septic symptoms.

The pressure symptoms are:

1. Pain. This may be substernal or dorsal, depending on the location of the abscess. Its severity depends on the degree of pressure.

2. Cough. The cough is brassy, non-productive, and paroxysmal.

3. Hoarseness, due to pressure on the recurrent laryngeal nerves.

4. Cyanosis of the face and neck, due to pressure on the superior vena cava.

5. Dyspnoea, due to pressure on the trachea.

The septic group of symptoms, fever, sweats, leucocytosis, etc., are in no way peculiar to this condition.

The diagnosis must be based on the history, the pressure symptoms, and the physical findings. A widened mediastinal dullness is the only constant physical sign. The heart may be displaced, the

liver may be pushed down, and the respiratory sounds may be affected, the degree of these changes being dependent upon the size and location of the abscess. When the abscess is below the level of the arch of the aorta it should be drained by a posterior mediastinotomy.

H. A. McKNIGHT, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Behan, R. J.: Lymphatic Drainage of the Ascitic Abdomen Through Paraffined Veins. *Boston M. & S. J.*, 1921, clxxiv, 521.

The author has devised a new method for the surgical relief of the ascitic abdomen. Ascites is generally due to cirrhosis of the liver. Cirrhosis is of two types, biliary and portal. The first type, which is frequently associated with jaundice, may often be benefited by drainage of the bile duct. For the type due to portal obstruction various operations have been devised: (1) the development of an anastomosis between vessels on the surface of the liver or the spleen and vessels on the under surface of the diaphragm or of the abdominal wall; (2) the development of an anastomosis between the omentum and the abdominal wall; (3) direct drainage of the ascitic fluid through a tunnel through the abdominal muscles into the subcutaneous tissue spaces of the abdominal wall; (4) direct drainage of the portal vein into the inferior vena cava or of the ascitic fluid through the implanted upper segment of the internal saphenous vein into the circulatory (venous) system; (5) lymphatic drainage by Handley's method by which ligatures are passed out from the abdominal cavity and inserted in various directions in the subcutaneous tissues. The first method is said to be successful in 37 per cent of the cases.

Behan devised the following modification of Handley's method.

A section of the internal saphenous (about 12 in.) was removed, immediately threaded onto a glass rod of suitable size, sent to a laboratory where it was put through the stages of preparation to which pathologic specimens are subjected in order that they may be sectioned, and fixed in paraffin. During this time the patient was kept in bed.

At the time for operation, which was performed under nitrous oxide-oxygen anæsthesia, an incision was made over the kidney area on the left side as for a nephropexy. The fatty capsule of the kidney was pushed backward and an opening made into the peritoneal cavity below the level of the lower pole of the left kidney. The paraffined vein was then placed in boiling water and again thoroughly sterilized. While it was still hot the glass rod was removed. This left a rigid tube of vein permeated with paraffin. Three sections were then made and the ends of each were cut transversely

so that two flaps were formed. The sections were 3 to 6 in. long.

One section was inserted into the upper portion of the peritoneal incision and the edges flapped back and sutured to the peritoneum so that the end of the tube led directly into the peritoneal cavity. The other end was inserted into the fatty perirenal tissue near the lower pole of the kidney, care being taken not to attach it to the fascia which was intimately connected with the kidney itself. The second tube was fastened into the peritoneal cavity in the same manner, being pushed down between the peritoneum and the fascia covering the pelvis and inserted in the loose tissue toward the external iliac artery, over the pelvic brim. As in the case of the first section, several small nicks were made in the tube so that fluid could leak through. The third tube was inserted into the peritoneal cavity at one end and the other end was carried through the abdominal muscles and subcutaneous fascia, almost to Poupart's ligament. Before the incision was closed it was noticed that all the tubes were patulous and fluid was being discharged from them into the tissues. The tissues were then approximated with catgut and the skin with silk-worm-gut. The peritoneum also was approximated to prevent herniation.

In the case reported by the author the patient progressed very well. After the operation the abdomen was 44 in. in circumference at the umbilicus. This circumference gradually decreased, until two weeks after operation it was 42 in.; at the end of one month, 40 in.; and at the end of two months, 36 in. Eleven months after the operation it was 31 in. The patient feels comfortable. She has no difficulty in breathing, is gaining in weight, and is able to do her daily housework. Her present weight is 157 lbs. **FREDERICK CHRISTOPHER, M.D.**

Cignozzi, O.: Operation in Cystic Empyema of the Sac of a Femoral Hernia with Generalized Peritonitis Simulating Strangulation (Intervento operativo in empiema cistico del sacco di ernia crurale con peritonite generalizzata simulante uno strozzamento). *Riforma.med.*, 1921, xxvii, 418.

The patient was a man 63 years of age who had had a femoral hernia for twenty years. He had been able to reduce the hernia easily until recently when reduction became very difficult and painful and was followed soon afterward by severe abdominal pain and vomiting which obliged him to seek hospital aid.

Examination showed a fluctuant, irreducible femoral tumefaction and signs of acute peritonitis.

At operation the hernial sac was found empty of omentum and intestinal loops, but a piece of necrotic omentum was discovered plugging the hernial orifice. When an attempt was made to pull this portion of tissue toward the operative field a flow of seropurulent fluid issued from the peritoneal cavity. Resting in the strip of omentum were intestinal loops showing acute inflammation and abundant fibrinous deposits. The necrotic omentum was excised and after a careful peritoneal toilet simple gauze capillary drains were inserted to drain the peritoneal cavity and the wound was closed with bandages. The gauze tampons were frequently changed during the next few days. Two or three months later, when the patient's condition permitted, a radical repair was done.

The author explains the mechanism of the supuration of the hernial sac and the consequent generalized peritonitis. One of the important factors was the reduction manœuvre practiced by the patient. This probably expelled the strangulated necrotic omentum and intestinal loops from the sac and by causing trauma led to infection of the serosa of the sac.

As regards the pathogenesis of empyema it seems evident from this case that an entero-omental strangulation followed immediately by complete reduction of the strangulated organs is able to give rise to a hyperacute infection of the serosa of a hernial sac, and as the omentum may act as a plug in the neck of the sac, a sero-fibrino-purulent intracystic collection may result which clinically shows as a fluctuating irreducible tumor in the femoral region, but may also invade the iliac region of the peritoneum. Study of this case appears to show that:

1. The inflammatory process arises originally in the hernial sac from the migration of bacteria probably from the intestinal lumen, a transmigration which is favored either by ommental adhesions or mechanical manœuvres upon the displaced intestinal loop in the sac on which the force of reduction acts.

2. The neck of the sac may be closed by the inflammation of the endothelium and by the surrounding tissues. Ascites of the sac may be produced by acute adhesions of part of the omentum which plug the hernial orifice and may become a true empyema as the result of the multiplication of bacteria.

3. The secondary, almost immediate, invasion through the ommental plug of the peritoneal serosa with the development of an acute generalized peritonitis gives the syndrome of paralytic ileus and of diffuse peritonitic inflammation without any anatomopathologic evidence of enteric strangulation.

The author also draws attention to the method of treating peritonitis by capillary drainage and ample incisions in the walls. In his practice of about 100 cases of such purulent processes he has never used

antiseptic or aseptic lavage but cleaned the focus with dry gauze and inserted capillary drains. He has never used rubber drainage tubes as he considers them dangerous in the recumbent position and in cases of intestinal perforation. The secret of success in this open treatment lies in ample incisions in the walls and as extensive use of drains as possible.

W. A. BRENNAN.

Segagni, S.: A Form of Plastic Peritonitis (Su una forma di peritonite plastica). *Policlin.*, Roma, 1921, xxviii. sez. prat., 651.

The author gives brief abstracts of four cases reported by Morquio and reports a case of his own, that of a child 5 years old. The condition begins with serious symptoms of acute peritonitis which soon improve, become localized, and give rise to characteristic plastic formations which run a slow, subacute course and finally undergo spontaneous resolution ending in recovery.

This form of plastic peritonitis is a true clinical entity appearing rather infrequently in early childhood. The nature of the infection causing it is not known. The condition is probably not tuberculous as there was no family history of tuberculosis in any of the cases, the patients were in good health before the beginning of the peritonitis, they recovered completely and permanently, and von Pirquet's reaction was negative.

The age of the patient is evidently of considerable importance in the pathogenesis as children react readily to stimuli by the formation of plastic tissue and this tendency begins very early in life as is evident from the occurrence of adhesive peritonitis during foetal life.

A. G. MORGAN, M.D.

GASTRO-INTESTINAL TRACT

Harrigan, A.: Linitis Plastica. *Ann. Surg.*, 1921, lxxiii, 551.

Linitis plastica is a rare disease in which there is very marked proliferation of the fibrous tissue of the submucosa of the stomach, particularly in the region of the pylorus. It is generally believed at the present time that this condition is in no way related to carcinoma or sarcoma, but is essentially a peculiar and benign form of fibrosis. The stomach as a whole is generally contracted and rigid and presents a somewhat mottled appearance. The walls are excessively thickened and inelastic. Pyloric stenosis is unusual.

The obstruction is caused by a gradual and uniform narrowing and approximation of the walls of the stomach. The thickness is due mainly to the marked expansion of the submucosa. The muscularis and the serosa take but a minor part in producing the thickening. Despite the decided alteration of the submucosa the border of the mucosa remains intact and uninjured.

The disease usually occurs in adults. A correct pre-operative diagnosis is practically impossible. The treatment is surgical. As the diagnosis is never definitely determined until the microscopic examina-

tion has been completed, the general rules and principles underlying the surgical treatment of carcinoma of the stomach should be followed. In short, if the technical conditions permit, partial or complete gastrectomy should be performed. If because of the debilitated condition of the patient or the occurrence of extensive adhesions to the adjacent viscera, gastrectomy is not feasible, gastrojejunostomy is indicated, especially if there is pyloric stenosis. While it appears that the latter operation is often curative, the extreme difficulty in recognizing the lesion, its tendency to resemble carcinoma, its uncertain nature, and the possibility that it might change to carcinoma undoubtedly make gastrectomy the operation of choice.

The author reports the case of a man 51 years of age. At operation a large tumor situated at the pyloric end of the stomach and extending along the lesser curvature was found. Several glands in the lesser omentum were distinctly involved. A partial gastrectomy and a posterior no-loop gastrojejunostomy were done. Microscopic examination showed the condition to be linitis plastica. The patient made an uneventful recovery and regained the 36 lbs. he had lost prior to the operation.

FREDERICK CHRISTOPHER, M.D.

Finsterer, H.: Acute Gastric and Duodenal Haemorrhages and Their Surgical Treatment (Ueber akute Magen- und Duodenalblutungen und ihre chirurgische Behandlung). *Deutsche Ztschr. f. Chir.*, 1920, clviii, 44.

The author is not in entire agreement with surgeons who hold that in cases of gastric hæmorrhage endangering life the risk of delaying operation until the patient has somewhat recovered is less than that of immediate operation. To him the decisive point as regards operation is the etiology of the hæmorrhage.

Hæmorrhage is caused most frequently by gastric and duodenal ulcer and in such cases it is of the utmost importance to determine whether the ulcer is a flat ulcer involving only the stomach wall, or a penetrating ulcer involving the neighboring organs. In the first case the bleeding is usually slight, while in the second, because of erosion of larger vessels, it may be abundant though it does not necessarily result in immediate exsanguination. It may be considerable also in cases of callous, non-penetrating ulcer if a large vessel in the stomach wall is involved.

Gastric bleeding of other etiology is of less practical significance, being usually noted first incidentally at laparotomy or at autopsy. Among such hæmorrhages are those due to varices of the stomach wall, intestinal hæmorrhages due to ascarides, bleeding from the common bile duct and from an aneurism of the aorta perforating into the œsophagus, hæmorrhages following acute infectious diseases and operations, and those due to arteriosclerosis. In cases of tumor the hæmorrhage is scantier but recurs more obstinately.

In cases of ulcer the character of the ulcer is often difficult to determine. Therefore the co-operation of an experienced internist with the surgeon is necessary if the treatment is to be most effective. The history is of the greatest significance in the diagnosis. Long duration of suffering with periodic recurrence of symptoms speaks for a callous or a penetrating ulcer, while complaints dating back only a few days suggest the presence of a flat ulcer. However, as a differential diagnosis is very often impossible, the author holds that in cases of severe hæmorrhage from an old chronic ulcer it is better to operate than to depend on internal treatment. The fact that spontaneous healing of large eroded vessels has been demonstrated on the autopsy table does not change his opinion.

With regard to the surgical treatment of recurrent hæmorrhage — for the first acute hæmorrhage only internal treatment is to be considered — the author states that recently those who urge active interference have become more numerous, renowned surgeons have deserted their previous position, and even he has arrived at the conviction that cases of profuse hæmorrhage do not belong exclusively to the internist, and that on the other hand simple gastro-enterostomy is not always sufficient.

Finsterer reports in detail the histories of 24 cases which were operated upon for acute gastric hæmorrhage. A distinction is made between direct and indirect methods of effecting hæmostasis. The first demand exposure of the bleeding ulcer by gastrotomy, following which the bleeding vessel may be ligated or undersewed or the ulcer cauterized or excised. Tamponing is not to be recommended. Resection results in a lasting cure while the other procedures are of a more palliative, symptomatic character. The indirect method of effecting hæmostasis aims at absolute rest and as complete evacuation of the stomach as possible to favor thrombus formation. Exclusion of the pylorus and gastro-enterostomy are to be considered as indirect methods. Gastro-enterostomy may be accused of not stopping the hæmorrhage with absolute certainty and the same may be said of jejunostomy. Moreover, the latter is regularly followed by an increase in the size of the ulcer.

The author considers resection as the best operation in these cases and performs it in desperate cases of exsanguination, but states that it should be done early, if possible within the first twelve to twenty-four hours. He does not take the compromise position that it should be performed only when internal treatment is without effect. In diagnostically doubtful cases an exploratory laparotomy is much less dangerous than uncertain delay. If the bleeding does not originate from an eroded vessel, a fact not difficult to determine, the abdomen is again closed. In other cases definite hæmostasis is effected.

Efforts should be made to determine the degree of the hæmorrhage and its character (continuous or intermittent) by every means possible, such as

repeated blood pressure and hæmoglobin determinations and counts of the red blood corpuscles. Chloroform and ether anæsthesia were chiefly responsible for the formerly so frequent fatal outcome. Since the general use of local anæsthesia the results have been better. A solution of novocaine no stronger than $\frac{1}{4}$ per cent should be used and a preliminary injection of morphine must be given. Splanchnic anæsthesia and paravertebral anæsthesia are strictly contra-indicated because they require large doses of novocaine. Exsanguinated patients react more severely to this class of toxins. Chloroform is to be avoided entirely, but ether by the drop method may be employed. By careful dosage pulmonary complications may be obviated.

Finsterer is convinced that if the advice given is strictly followed the results of the treatment of acute gastric hæmorrhage will improve and the mortality decreased.

KNOKE (Z).

Geilinger, W.: The Diagnosis of Ulcer of the Lesser Curvature of the Stomach (Beitrag zur Diagnostik des kurvaturalen Magengeschwures). *Schweiz. med. Wchnschr.*, 1921, li, 25.

On the basis of seven cases of his own and the literature regarding the diagnosis of the site of gastric ulcers, Geilinger attempts to define the clinical and X-ray syndrome of ulcers of the stomach other than pyloric ulcers, particularly those on the lesser curvature. More than half of the ulcers of the stomach are near the pylorus and about one ulcer in five is on the lesser curvature.

In the pyloric syndrome of Soupault a typical symptom is pain immediately following the ingestion of food. The localization of pain exclusively in the middle or the left half of the epigastrium, the vomiting of a small amount of clear, non-acid vomitus immediately after eating, and severe cramp-like and cutting pain in the cardia are characteristic of ulcer of the lesser curvature. There is no difference in the hæmorrhage from ulcers in the different locations, but the position of pressure pain is valuable in the differential diagnosis. Pressure pain on the left side combined with reflex tension of the left rectus muscle is characteristic. Ulcer of the lesser curvature does not cause hypersecretion. The acid values are normal or subnormal.

There is no great difference in motility, but pyloric or juxtapyloric ulcers generally cause earlier and more definite delay in the passage of food. From the examination of his own cases the author has come to the conclusion that in gastric ulcer, except ulcer of the pylorus, the motility of the stomach is almost normal. The cause of delayed motility in cases of ulcer of the lesser curvature he believes is a mechanical factor, i. e., involvement of the serosa, perigastritis, and infiltration rather than a hypothetical reflex spasm of the pyloric sphincter.

Ulcers of the curvature are frequently overlooked, as they are often clinically latent or atypical.

DUMONT (Z).

Erdmann, J. F.: Marginal, Gastrojejunal, or Peptic Ulcer Subsequent to Gastro-Enterostomy. *Ann. Surg.*, 1921, lxxiii, 434.

While it is true that recurrent ulcer after gastro-enterostomy is frequently due to the use of non-absorbable suture material, it occurs also in cases in which absorbable sutures are used throughout. In the latter it may be due to injury of the mucosa by clamps or forceps. Heat may also be a factor as in the causation of the primary ulcer. Chemical action and bacteria must be considered as causes if it is accepted that in the gastro-enterostomy the cause of the original ulcer has not been removed.

From the findings of several cases the author is led to believe that there is an idiosyncrasy to the formation of ulcer in certain persons. The usual site of these ulcers was on the posterior wall of the stomach near the opening or its posterior margin and in the lower portion of the jejunal surface of anastomosis.

The symptoms are like those of duodenal ulcer, only more intense. The X-ray has not been satisfactory in interpreting secondary ulcer. Prophylactic measures are the avoidance of trauma to the mucosa by clamps, the use of absorbable suture material, the suturing of each layer separately, and the avoidance of hot foods.

If a fair medical test fails, the treatment is surgical as in the primary condition.

Case histories follow. I. E. BISHKOW, M.D.

D'Agostino, F.: A Continent Gastrostomy (Nuovo processo di gastrostomia sfinterica). *Arch. ital. di chir.*, 1921, iii, 285.

A new method of performing gastrostomy is described which prevents the discharge of food from the stomach through the opening. A cone of stomach is passed through two slits in the right rectus muscle from left to right so that it is folded back on its normal course and the overlying muscle acts as a sphincter.

A case of diverticulum of the œsophagus in which the operation was done is described. The patient is fed through the gastrostomy and is gaining weight.

A. G. MORGAN, M.D.

Finney, J. M. T.: Acute Intestinal Obstruction. *Surg., Gynec., & Obst.*, 1921, xxxii, 402.

Finney has made a study of 245 consecutive cases operated upon by various surgeons at the Johns Hopkins Hospital and the Union Memorial Hospital of Baltimore in a period of ten years. There were 8 cases of intussusception, all in patients under 1 year of age, and 8 cases of volvulus, all in patients of middle age or older. The ratio of male to female patients was $2\frac{1}{2}$ to 1. In the author's opinion negroes are slightly more subject to intestinal obstruction than whites. This difference he attributes to the high incidence of inflammatory pelvic disease among negroes.

Of the 245 patients whose cases are reviewed, 217 were operated upon, and of these, 141 recovered.

The mortality was 36 per cent. From a study of the different operations performed and the circumstances under which they were done it seemed that the result depended more upon the patient's condition at the time of the operation, the length of time which had elapsed since the onset of the symptoms of obstruction, and the condition of the bowel than upon the nature of the operation itself. Other factors being equal, resection seemed to compare very favorably in its results with the simpler forms of operation.

In the acute cases the shortest interval between the onset of symptoms and the operation was four hours. The mortality rate was 5 per cent in cases operated upon in the first twelve hours, 11 per cent in those operated upon in the second twelve hours, and 31 per cent in those operated on in the second twenty-four hours. There were 50 cases of strangulated hernia, of which 40 were inguinal, 6 femoral, 3 ventral, and 1 umbilical. There were 14 cases of adynamic ileus; 7 were fatal and 7 resulted in recovery. Forty per cent of the total number of patients had had previous abdominal operations. These consisted almost exclusively of appendectomy or drainage of an appendicial abscess or some pelvic condition which in most cases was of inflammatory origin. The mortality in the cases of obstruction following strictly pelvic conditions was 50.9 per cent. Of the symptoms, pain, which was generally pronounced, of sudden onset, and colicky in character, was present in 83 per cent, nausea and vomiting in 80 per cent, constipation in 58 per cent, distention in 48 per cent, and visible peristalsis in 20 per cent.

The mortality of enterostomy was 60 per cent but this high rate might be attributed to the fact that the operation was done only in the most extreme cases. In resection of the intestine, which was generally followed by entero-anastomosis and occasionally by enterostomy, the mortality was 33 per cent. When the viability of the bowel is doubtful and the patient's condition such as to justify it, resection of the injured segment either with or without enterostomy and preferably with immediate entero-anastomosis appears to be the operation of choice. The author has included 65 cases of chronic intestinal obstruction in his series. Twenty-four of these were cases of cancer of the colon; 7, cases of tuberculous peritonitis and ulceration; and 4, cases of megacolon, etc. In most of the remainder the condition was due to adhesions following previous operations upon the appendix or pelvic organs.

Any part of the intestinal tract may be obstructed and the obstruction may be acute, subacute, or chronic, complete or partial, and due to any one of a variety of causes, such as intussusception, volvulus, foreign bodies, internal strangulation, enteroliths, intestinal parasites, bands, adhesions, kinks, twists, paralysis, tumors, congenital defects, megacolon, Meckel's diverticulum, etc. At times, intestinal obstruction may be simulated by other conditions such as typhoid fever, Henoch's purpura, certain infections, appendicitis, angioneurotic oedema, the

twisted pedicle of a tumor, lead colic, renal colic, gallstones, mesenteric thrombosis, diaphragmatic pleurisy, etc.

The gravity of intestinal obstruction is due to three factors; (1) arrest of the faecal current, (2) interference with the free circulation in the affected segment of the intestine, and (3) constitutional symptoms due to the resorption of poisonous chemical products from the upper intestinal tract. The author calls attention to the difficulty of making a diagnosis in cases in which obstructive symptoms develop within a few days after an abdominal operation when the purely obstructive symptoms may be masked by those usual in postoperative conditions. The important point in these cases is to recognize those which do not respond to gastric lavage, enemata, and the proper administration of cathartics and in which the symptoms are becoming progressively worse, and to re-open the abdomen before irreparable damage has been done.

In cases of doubt it is always safer to operate. The determining factors are the intestinal character of the vomitus, the failure of lavage and enemata to relieve vomiting and tympanitis, and an increasing pulse rate with restlessness and thirst. The classical symptoms of shock generally indicate more severe damage to the segment of intestine involved. Distention is a fairly late manifestation and is more pronounced the lower the obstruction. The vomitus consists at first of stomach contents and later of bile-stained mucus and fluid from the duodenum and upper intestinal tract. Subsequently it becomes stercoraceous. Hiccough is a symptom of the later stages. As the condition progresses the patient develops an anxious expression which is associated with pallor, cold sweat, sunken eyes, rapid pulse, subnormal temperature, dryness of the mouth, severe thirst, and an excessively high leucocyte count. The urine becomes decreased in quantity and frequently contains large amounts of indican.

As a reason for the diminution in the number of adhesions the author mentions the better observance of the fundamental principles for their prevention, i.e., gentle handling of the tissues, surgical cleanliness, discontinuance of the use of drains made of large quantities of unprotected gauze, and the repeated removal and replacement of drains. Of the series of cases reviewed 6.9 per cent in which well-marked symptoms of obstruction were present resulted in recovery after medical treatment without operation.

Finney draws the following conclusions:

1. Difficulty may be experienced in making a diagnosis, especially in postoperative cases.
2. A definite diagnosis is not necessary before operative measures are begun.
3. Early diagnosis is the most important factor of all. It is more important to perform the operation early than well; better a poor operation on a patient in good condition than a good operation on a patient in poor condition.

4. Operation is perhaps too often delayed in the postoperative cases by the fact that the patient has just gone through a major surgical operation and both he and the surgeon dislike exceedingly the prospect of another; also by the fact that in many cases in which there are symptoms strongly suggesting intestinal obstruction, especially after certain forms of abdominal operation, complete recovery follows rest, gastric lavage, starvation, enemata, and medical treatment.

FREDERICK CHRISTOPHER, M.D.

Flint, E. R.: Acute Intestinal Obstruction: A Series of 282 Cases. *Brit. M. J.*, 1921, i, 729.

In a series of 282 consecutive patients operated on by the author in a two-year period the mortality was 15.6 per cent. Exclusive of 170 cases of obstruction due to external hernia and 42 cases of carcinoma, there were 70 cases of obstruction with a mortality of 28.5 per cent. This comparatively low mortality is attributed to the employment of methods suggested by recent experimental work.

In addition to the usual procedure of operating as soon as possible, preserving warmth, and washing out the stomach, two other measures are of prime importance, namely, saline infusion and the administration of morphine.

Saline infusion should be given before operation at the rate of at least 2 pts. an hour and continued during and after operation at half this rate. Five per cent glucose should be added and is usually given subcutaneously although if it is retained it is absorbed more quickly if given by rectum. The earlier it is given the better the effect.

Morphine should be administered as soon as operation is advised, $\frac{1}{4}$ gr. at once and $\frac{1}{8}$ gr. every half hour until the rate of respiration falls to 12 a minute. It should be continued postoperatively for twenty-four hours.

In the operation a right para-umbilical incision splitting the rectus is best. Precision, gentleness, and a minimum of exposure are essential. Inaccurate work is responsible for many deaths. Plenty of warm, moist towels to cover the intestines and more than usual care to avoid soiling are of importance. Preliminary examination of the cæcum and terminal ileum is a useful and practical point. Distention means obstruction below. A collapsed ileum can be followed up until the obstruction with distention of the bowel above it is found.

The mortality was 9.3 per cent in cases not requiring resection and 47.8 per cent in those requiring resection. Hence experience in determining whether the intestine is viable or not is important. When the walls are of an abnormal color and, in addition, feel limp and offer no sensation of firmness to the fingers recovery is unlikely.

Resection followed by lateral anastomosis is the operation of choice. Enterostomy should be done only in desperate cases and should never be performed merely to drain the intestine.

R. W. NICHOLS, M.D.

Louria, H. W.: The Blood-Urea Nitrogen in Acute Intestinal Obstruction. *Arch. Int. Med.*, 1921, xxvii, 620.

Louria describes seven cases of acute intestinal obstruction, in all of which there was an increase in the blood-urea nitrogen. The lowest reading was 54 mg. per 100 c.cm. and the highest, 170 mg. In one case in which it was 130 mg. per 100 c.cm., the phenolsulphonephthalein excretion was found to be 58 per cent in two hours and ten minutes.

In one case a generalized urticarial eruption appeared while the patient was recovering from an acute ileus. As the substance which causes the toxæmia of acute intestinal obstruction is presumably proteose in nature, it was concluded that this eruption was probably a cutaneous manifestation of proteose intoxication.

All of the patients were free from evidence of chronic renal disease. Therefore the assumption is warranted that the elevation in the blood-urea nitrogen was due to acute intestinal obstruction.

SAMUEL KAHN, M.D.

Pansera, G.: Ileus Caused by Gall-Stones (Ileo da calcoli biliari). *Policlin.*, Roma, 1921, xxviii, sez. prat., 475.

Ileus caused by gall-stones was first described by Bartholin in 1654. In 1914 Wagner collected 334 cases from the literature. Of these, 161 were operated upon. The mortality was 62 per cent. Of the 173 patients not operated on, 93 recovered after spontaneous passage of the stone and 80 died. Since Wagner's publication about 30 cases have been reported. Most of the patients were women and the condition was not preceded by signs of gall-stones. The statistics as to the relative frequency of this form of intestinal occlusion vary from 1 in 15 to 1 in 28.

The author describes the case of a woman 64 years of age who for five months had had pain in the epigastrium and slight fever. There had been no icterus or vomiting and no blood in the stools. A few days before the patient's admission to the hospital the pain had become very intense, the abdomen became distended, and it was impossible to cause a movement of the bowels even by giving purgatives. When the patient was seen by the surgeon her general condition was so unfavorable that he advised against operation, but as it was impossible to obtain a bowel movement and vomiting became frequent he made an artificial anus. Death followed.

Autopsy showed dilatation of the first part of the small intestine, the lower third being small and collapsed. There was an opening between the gall-bladder and the second portion of the duodenum to which the gall-bladder was adherent. At the juncture of the middle and lower thirds of the ileum were two gall-stones. The lower and larger one occluded the lumen.

The diagnosis of ileus caused by gall-stones is difficult during life. While in the case reported there

had been no symptoms until five months previously, the inflammation around the gall-bladder indicated that the process was much older than that, and the fact that the gall-stones were faceted indicated that they had been in contact with others which had probably been passed. The two stones discovered, being too large to pass through the ducts, had caused inflammation and local peritonitis which brought about the adhesions between the gall-bladder and duodenum. Finally the pressure of the stones had caused perforation, and the calculi had passed down the intestine until the decreasing size of its lumen had prevented their further progress.

As a rule stones pass through an opening made in this way between the gall-bladder and duodenum, but sometimes they cause such a dilatation of the common and cystic ducts that they are able to pass through the ducts. If the surgeon finds the intestine occluded by a gall-stone he should always make an examination for other stones which might cause obstruction and necessitate operation later.

A. G. MORGAN, M.D.

Summers, J. E.: Enterostomy in the Treatment of Acute Intestinal Obstruction. *Surg., Gynec. & Obst.*, 1921, xxxii, 412.

The author discusses the different types of enterostomy which have been done in efforts to relieve acute intestinal obstruction. Nélaton's operation consists in making a small incision in the right iliac region and suturing into the wound the first coil of intestine which presents itself. The bowel is opened immediately or several hours later. Subsequently it was found that Paul's glass tubes or rubber tubes could be sutured into the intestine to drain the bowel effectively and removed later to allow the opening in the intestine to close. Thus the nuisance of an intestinal fistula which not infrequently necessitates a second operation for its closure is done away with.

In serious cases of acute intestinal obstruction a primary enterostomy may be made as a life-saving procedure to be followed later, if necessary, by an abdominal section to find and relieve the cause of the obstruction, or a combined operation may be performed, an enterostomy opening being made in a coil of distended intestine to favor convalescence after the removal of the cause of the obstruction. In cases of peritonitis ileus, the focus causing the peritonitis (such as a gangrenous appendix) is removed and through the same incision the first or most accessible coil of distended intestine is opened and drained through a rubber tube fixed into it by a pursestring suture.

When in intestinal obstruction the character of the vomitus is intestinal or fecal, Bonney recommends a jejunostomy draining the "segment of toxicity." Positive proof of the value of a jejunostomy under such circumstances is that it causes immediate cessation of the vomiting. The author believes that unless the vomitus is frankly fecal the drainage tube

should be introduced into highest segment of bowel which is distended rather than into the highest part of the jejunum if the latter is not distended.

If in a search for the obstruction the small bowel is found to be much distended, the coils farther away from the obstruction are heavy and contain much liquid; while those nearest the obstruction are light, their contents being chiefly gas. The heavy coils should be opened at several points to evacuate their contents. In some cases it is wise to fasten the drainage catheter by an invaginating technique into the highest opening made for the relief of the distended gut. The other openings should be sutured. FREDERICK CHRISTOPHER, M.D.

Dubs, J.: Secondary Enterostomy After Operations for Peritonitis (Die sekundäre Enterostomie nach Peritonitisoperationen). *Schweiz. med. Wchnschr.*, 1921, li, 52.

The author points out that the fate of the patient with general peritonitis depends chiefly on the condition of the intestine. After the organism is freed from the highly toxic intestinal contents survival is usually assured if the intestinal function can be restored. The surgeon must therefore combat intestinal paralysis with all the means at his command. Chief among these is secondary enterostomy, which was recommended by Heidenhain at the Surgical Congress of 1902, but has not been accepted by all surgeons.

As a further contribution to this disputed question the author reports the results of this operation in the treatment of peritonitis at the Winterthur hospital during the past five years. There were 24 cases; 6 of the patients recovered (25 per cent). None of them was more than 25 years of age. The clinical picture in every case was that of a progressive peritonitis with signs of intestinal paralysis — complete cessation of movements of feces and flatus, distention of the abdomen, dry tongue, vomiting, etc.

The chief difficulty with regard to the operation is the decision as to when it should be performed; it must not be done too soon or too late. While no definite rules can be established, the author states that it should be performed before the intestinal paralysis has extended to large segments of the intestine, and before the symptoms of ileus are fully developed. Primary enterostomy for all cases is not justifiable.

As far as the prognosis is concerned, it does not seem to make any difference whether the ileus is mechanical or paralytic in nature. Of greater importance is the manner in which the intestinal fistula functions. The continuous and free passage of feces and gas through the enterostomy opening is a favorable sign. Dubs uses Heidenhain's original technique. He makes the incision through the left rectus to the level of the umbilicus under local anesthesia and then draws forward, sutures to the peritoneum, and opens the first distended loop which presents itself.

DENCKS (Z).

Judd, E. S.: Pathologic Conditions of the Duodenum. *J.-Lancet*, 1921, xli, 215.

The duodenum, an organ of great importance anatomically and physiologically, is not essential to life and comfort and may be removed if provision is made for the pancreatic and bile ducts. Partial excision has been done in man during surgical procedures, and complete excision in animals, without untoward results. Dilatation, diverticulum, ulcer, and carcinoma are the pathologic conditions most often indicating surgical interference.

Dilatation extends throughout the entire length of the duodenum and into the upper part of the jejunum. It may be caused by paresis interfering with normal peristalsis or by infection involving the musculature. In 3 pronounced cases the author was unable to find any cause of a mechanical nature. Two cases are reported, in one of which enlarged glands in the mesentery at the duodenojejunal angle were found, and in the other a mass, apparently inflammatory, which caused obstruction at the duodenojejunal angle.

A diverticulum may be congenital, but usually is an acquired lesion produced by the contracting scar of ulcer. It may not cause symptoms or it may produce symptoms similar to those of ulcer, but without food relief. In the author's experience, true diverticulum is rare, but pouchings and sacculations, with or without associated ulcer, are comparatively common.

During the past fifteen years 4,901 operations for duodenal ulcer were performed at the Mayo Clinic. The ulcer was in the first inch of the duodenum in more than 90 per cent of the cases. It occurred four times as often in males as in females. In the past few years exploration of the duodenum by incision has been done much more frequently and multiple ulcers have been found which were not suspected; hence when no ulcer is demonstrable but a positive history or positive roentgenogram is obtained incision and exploration are advisable.

The ulcerations are of two types:

1. The ulcer with the gross appearance and histologic characteristics of gastric ulcer, which is called true ulcer.

2. The ulcer with less induration and a lack of crater formation which is often difficult to feel. The mucous membrane seems to cover the entire surface but close examination reveals one or several pin-point ulcers and the submucosa and muscularis are infiltrated with round cells. This type is called duodenitis or submucous ulcer. A study of 64 cases of this type indicates that it is not an early stage of true ulceration.

The diagnosis and treatment of the two types of ulcer are the same. The sequelæ of both types also are similar, consisting of contraction of scars which is often stellate, frequently the formation of pouches and diverticula, and occasionally stenosis of the lumen or even complete obstruction. Acute perforation is fairly common, and chronic perforation occurs in 28 per cent of the cases, at times with

involvement of the common duct or portal vein. Hæmorrhage is common in the true ulcer type but rare in the duodenitis type.

Primary carcinoma is extremely rare. In a series of 3,500 cases of primary carcinoma of the stomach and large bowel, only 5 cases of primary carcinoma of the duodenum were found, and it was impossible to be absolutely certain that the cancer was primary in this region.

R. W. NICHOLS, M.D.

Scheele, K.: The Diagnosis of Duodenojejunal Hernia (Beitrag zur Diagnostik der Hernia duodenojejunalis). *Zentralbl. f. Chir.*, 1921, xlviii, 188.

Though duodenojejunal hernia is by far the most frequent form of internal hernia, constituting 90 per cent of all cases, it is still fairly uncommon and in only a few cases is the correct diagnosis made before operation. Generally it has been found by chance at autopsy or at operation for acute strangulation ileus. It was only after the introduction of the roentgen rays that progress was made in the diagnosis.

The descending part of the duodenum is dilated to the size of the stomach; that is, there is duodenal stenosis. Heretofore it has been impossible to discover the cause of this stenosis without operation. In a case Scheele observed carefully he found that the hernial sac, which as a rule contains the entire small intestine, gradually distends and that finally the mouth of the hernia lies at the level of the cæcum. The hernial sac then has an arched line from the left upper abdomen to the cæcum. With a bismuth meal the loops of small intestine can be rendered visible, and if their contours also show the arched lower boundary line mentioned the author regards it as a sign of internal hernia, especially of duodenojejunal hernia.

KNOKE (Z).

Case, J. T.: The Surgical Physiology and Pathology of the Colon from the X-Ray Standpoint. *N. York State J. M.*, 1921, xxi, 156.

The author discusses colonic peristalsis under normal and pathologic conditions and calls attention to the diagnostic and operative errors which may occur if the changing appearance of the colonic shadow during peristalsis is not known. Particular emphasis is laid upon the prolonged stay of food residue in the cæcum and proximal colon, and the resulting pain on the right side, distention, and fullness, suggesting appendiceal involvement, which are due to some obstructing organic or functional lesion in the distal colon or rectum. A careful study of the entire colon, including the pelvic loop and the rectum, is necessary before such relatively rare or inconsequential lesions as adhesions of the terminal ileum or cæcum, fixation of the appendix, so-called Jackson's membrane, hepatocolic bands or membranes, or a supposed ptosis of the transverse colon may be accepted as the cause of the pain on the right side.

The outline of the normal colon from the roentgenologic standpoint is exceedingly variable and

ever-changing. The motor function is of far greater significance than the morphological factor. Ptosis *per se* is relatively unimportant. The mobility of the various parts should be ascertained and a careful search made for filling defects due to intra- or extra-colonic tumors. The position of the transverse colon is especially variable because of turning and winding snake-like movements without actual transportation of the contents of the bowel. The prevailing movement in the proximal bowel under normal conditions is antiperistaltic in its effects and may be greatly increased under abnormal conditions. The distal colon has as its characteristic activities churning and onward movements. The principal propulsive movement of the colon is the spontaneous large contraction activity in which sausage-shaped masses of content move with more or less rapidity for variable distances. This the author calls "spontaneous mass movement." It has a relation to bowel evacuation and is seen most constantly before or during defæcation. Observation of the opaque enema may reveal a large ring constriction passing along the colon.

Among the various phenomena due to peristalsis which may lead to diagnostic error are:

1. Pseudo-filling defects resembling those due to neoplasms.

2. Proximal colon stasis, especially cæcal stasis, due to exaggerated antiperistalsis, which may be incorrectly attributed to membraniform or band adhesions involving the cæcum, the ascending colon, or the hepatic flexure, or the supposed prolapsus of the transverse colon. Although such conditions may be responsible for stasis at times, the author has found that lesions in the distal colon are far more commonly responsible. Enterospasm is often associated with distal colonic adhesions.

3. A point of arrest in the transverse colon just proximal to the midline which may be attributed erroneously to an organic obstruction. This point corresponds to an area described by various observers as a tonic constriction ring.

4. The disposition of the opaque residues shortly after a mass movement which has cleared the distal colon below a certain point in the descending colon. This may simulate chronic obstruction.

In conclusion the author states that the roentgen study of the colon must be conducted by fluoroscopic as well as roentgenographic means, and the value of the screen method far outweighs the value of plates. Moreover, it must be recognized that the evidence obtained by X-ray study constitutes only a part of the examination of the patient, and must be interpreted in the light of the history and the physical and laboratory findings.

ADOLPH HARTUNG, M.D.

Peck, C. H.: Obstructions of the Colon and Ileocæcal Regions. *Surg., Gynec. & Obst.*, 1921, xxxii, 408.

The author reviews the work of the second surgical division of the Roosevelt Hospital since Janu-

ary 1, 1910. In a total of 9,268 operative cases he found 138 cases of obstructive lesions of the colon and ileocæcal region. These did not include lesions of the rectosigmoid and the rectum. There were 103 non-malignant cases which he classifies as follows:

Postoperative conditions, 26; postinflammatory and congenital bands and adhesions, 58; diverticulitis, 8; tuberculosis of the cæcum or colon, 8; megacolon, 3; and herniæ of the colon (obstructed or strangulated cases, number not compiled). There were 35 cases of obstruction due to carcinoma. The obstruction occurred in the cæcum in 3, in the ascending colon and hepatic flexure in 12, in the transverse colon in 3, in the descending colon and splenic flexure in 5, and in the sigmoid in 12. In the postoperative cases omental and peritoneal bands and adhesions were the usual offenders. In some of these the condition was remedied only with much difficulty, while in others it was easily relieved. Peck warns against sweeping iodine from the skin into the peritoneal cavity and rinsing the hands in bichloride solution before introducing them into the abdomen.

The typical Jackson's membrane he found to consist of short, tense peritoneal bands which usually were attached to the ascending colon at its anterior longitudinal band so that they fixed and constricted the gut to a varying degree and rotated it to the right on its long axis, often from 60 to 90 degrees.

Of the 35 cases of malignant obstruction 18 were treated by radical operations. Among these there were 15 recoveries and 3 deaths. Of the 15 patients who recovered, 12 were alive after the following postoperative periods of time: 2, ten years; 2, nine years; 1, seven years; 1, five years; 1, three years; and 5 one year or less.

In dealing with malignant growths those reasonably movable and without metastasis or with secondary deposits limited to adjacent accessible glands or omentum should be excised if this is permitted by the patient's general condition. Radical excision should not be done without preliminary colostomy in the presence of any considerable degree of obstruction with distention of the proximal gut. While closure of both segments with lateral anastomosis was formerly the operation of choice, end-to-end anastomosis, even in ileocolic resection, is becoming more and more the author's routine procedure as he believes it gives better results.

FREDERICK CHRISTOPHER, M.D.

Wilkie, D. P. D.: Carcinoma of the Appendix Causing Diverticula of the Appendix and Acute Appendicular Obstruction. *Brit. J. Surg.*, 1921, viii, 392.

The author reports three cases of spheroidal-celled tumor of the appendix in which operation was done for symptoms of acute appendicitis. The patients were 15, 17, and 22 years of age and only one had had a previous attack of pain.

In every case the tumor was found causing obstruction to the lumen of the appendix at the cæcal

end and associated with inflammation and diverticulum involving all the coats of the wall. It appeared as a yellow encapsulated mass with no evidence of metastasis. In one case there was a second similar tumor at the tip of the appendix.

Graham reported a spheroidal-celled tumor in 72.8 per cent of 172 cases of primary carcinoma of the appendix. Reiman reported 0.13 per cent of carcinomata in 13,157 appendices examined, 75 per cent of which occurred in females. MacCarty and McGrath reported the average incidence of carcinoma as 1 in every 225 appendices, and the average age as 30 years; 75 per cent occurred in females and 90 per cent at the tip of the appendix.

Carcinomata of the appendix appear to be benign. Aschoff, doubting whether they are true carcinomata, calls such tumors "mucous membrane nævi." Luce found only 12 authentic cases of malignant tumor of the appendix. McKenty points out that no authentic case of metastatic growth following carcinoma of the appendix has ever been reported in which the spread of the disease from the cæcum could be definitely excluded.

FRANK S. SCHOONOVER, M.D.

Algave, P.: The Treatment of Fæcal Fistulæ in the Region of the Appendix (Au sujet du traitement des fistules stercorales de la région appendiculaire). *Bull. et mém. Soc. de chir. de Par.*, 1921, lxxvii, 647.

Besides fistulæ due to cancer and to actinomycosis, the appendicular or para-appendicular fistulæ most commonly observed are of two types: (1) the ordinary intestinal fistulæ due to the opening of an abscess or to gangrene, etc., and (2) tuberculous fistulæ. Each of these types demands different treatment.

The natural tendency of the first type is to close spontaneously or after simple treatment, but the gravity of tuberculous fistulæ is such that often exclusion of a segment of diseased intestine is necessary. In cases of the latter type the tuberculosis is usually not limited to the appendix but associated with tuberculosis of the cæcum, the ileocolic valve, or the ileum. In tuberculosis localized to the ileocæcal segment, which is of interest to the surgeon because it may be cured by operation, it is very rare for the tuberculosis to extend more than 15 or 20 cm. downward. On the basis of a study of 52 cases of ileocæcal tuberculosis the author distinguishes six types:

1. An enteric granulo-ulcerous type, which was present in 28 cases, and in which the mucosa alone is diseased.

2. An entero-peritoneal type, seen in 14 cases, in which granulations are visible on the serosa and granulo-ulcerous lesions on the mucosa.

3. A fibro-adipose type, observed in 5 cases, which often enlarges or narrows the caliber of the intestine.

4. An atrophic type.

5. A local peritonitic type.

6. Ileocæcal adenopathy without intestinal lesions.

The first three types are those most commonly observed.

In nine cases out of ten, when the surgeon operates upon a tuberculous appendix, one or another of the lesions mentioned will be found in the ileocæcal region. However, the first type, which is the most frequent, often escapes detection. Such a lesion is apt to form a fistula after the removal of the appendix. The fistula may originate at the site of the ligature placed at the base of the appendix or at any point from 15 to 25 cm. above or below it. It may be formed by direct perforation of an ulceration in the immediate neighborhood of the appendicular stump or by the opening of an abscess into the same region. In some cases multiple fistulæ may be formed.

On the basis of the pathologic anatomy, the operation of choice for the closure of fæcal fistulæ complicating appendicular tuberculosis is bilateral exclusion of the diseased part of the intestine. Treatment directed against the fistula itself will fail. The incisions should be made on the ileum from 15 to 20 cm. above the ileocæcal valve and on the colon about 20 to 25 cm. below the valve. Algave insists that every effort should be made to preserve as much of the large intestine as possible.

W. A. BRENNAN.

Pendl, F.: A New Principle in Surgery of the Colon and Rectum (Ueber ein neues Prinzip in der Chirurgie des Dickdarms und Mastdarms). *Arch. f. klin. Chir.*, 1920, cxiv, 486.

Pendl states that he has not obtained encouraging results with the Mikulicz two-stage resection of the colon. The danger of the one-stage resection lies principally in the hardening of the stool. He therefore has been led to administer 1 to 1½ tablespoonfuls of castor oil the first morning after the operation and a half tablespoonful each succeeding morning for eleven days to soften the stool. As a further precaution the gut is emptied as thoroughly as possible before the operation. The diet consists of liquids and thin soups throughout the entire period.

The two-row interrupted suture is used. Pendl emphasizes the advantages of end-to-end anastomosis. Silk is the suture material of choice. The first row of sutures includes only a very narrow margin of mucous membrane but the greatest possible amount of wound surface. The peritoneum is completely closed in every case.

The procedure described has been used with very gratifying results in seven cases of cancer of the rectum. Resulting fistulæ were always small and closed rapidly. In two cases there was primary healing of the rectum.

To prevent sluggishness of the stool, Pendl leaves a properly shaped glass spool in the rectum following operation for the removal of tumors below the transverse colon. This may remain in place for weeks without danger. It provides a free outlet for

faeces and gas and therefore prevents over-distention of the bowel. O. NORDMANN (Z).

François, J.: A Continent Artificial Anus Formed by Cutaneous Tunneling (Anus artificiels continents par le procédé de la tunnellation cutanée). *Presse méd.*, Par., 1921, xxix, 355.

Sauerbruch's method of suturing tubes of skin in the muscles in cinematization operations has been used by François in forming a continent artificial anus. The same method has been employed by Ombrédanne in the treatment of epispadias and hypospadias.

François cuts rectangular strips of skin above, below, and on both sides of the site at which the anus is to be formed. The free edge of the lower strip is toward the pubes, while the base is toward the new anus and about 1 cm. distant from it. In the upper strip the pedicle is toward the anus. The axis of each strip is parallel to the anal axis. In the dissection of the strips fatty tissue is left adherent. The proximal parallel edges of the two strips are sutured together, and also the distal parallel edges. Each strip then forms a tube, the epidermis being internal and the fatty surface external. A buttonhole is made in the center of the base of each strip and subcutaneous tunnels parallel to the line of the anus are bored at each side of it. The free end of each skin tube is then seized with a forceps and the tube is drawn through the tunnel so that at the site of the anus the tubes are contiguous. Ten or fifteen days later the anal opening is made by the usual procedure so that it lies exactly between the two subcutaneous tunnels, and the end of the colon is fixed.

A special apparatus is applied about three weeks later. This consists essentially of two thin steel rods covered with rubber and passed into the subcutaneous tunnels. By an external mechanism connecting them, the two rods can be gently squeezed together so that they hermetically close the mucous lips of the anus.

Two cases are reported in which the operation described gave satisfactory results. W. A. BRENNAN.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Simon, L.: A Contribution on Hepatico-Choledochoduodenostomy by Means of a Rubber-Prosthesis (Beitrag zur Hepatico-Choledochoduodenostomie mittels Gummiprothese). *Beitr. z. klin. Chir.*, 1920, cxx, 344.

When a defect of the bile passages must be repaired during an operation but direct anastomosis is not feasible and the detour by way of the gall-bladder is not possible, there remain two groups of operative possibilities: (1) direct union of the free portions of the bile ducts with the intestine; (2) bridging of the defect by means of a thin rubber drain.

To the first group belongs choledcho-enterostomy, hepatico-enterostomy, cholangio-enterostomy, and

their modifications. The anastomosis may be either terminal or lateral. The technical difficulties depend upon the anatomic findings peculiar to the patient and are usually considerable. In some cases the method indicated by Dahl may be applicable.

In the second group a rubber prosthesis is used. The tube is so placed that it may be removed later, or is buried and left in place. This latter indication is fulfilled by the method of Brewer and Wilms. In the methods which aim at later removal of the tube and in which a portion of the free supraduodenal part of the common bile duct may be used, the tube is introduced through an oblique artificial fistula. Simon has used this method with very good results in 5 cases. The technique is simple. It is of importance to cover the drainage tube with peritoneum (ligamentum hepatoduodenale, omentum, or pedicled flaps of the serosa of the duodenum). Important also is the protrusion of the duodenal mucosa in the direction of the common bile duct so that the proliferation of the mucosal epithelium may occur correctly. The epithelialization takes place rapidly. Over-rapid expulsion of the tube has not been observed.

The advantages of the rubber prosthesis are, first, that the so-frequent unfavorable tension present following direct suture is avoided, and second, that the long oblique canal in the duodenum or stomach wall is much less favorable to the expulsion of duodenal or stomach contents into the common duct.

In order to secure a more natural presentation of the bile system, no pad is inserted under the patient's back. The organs of the epigastrium then lie before the operator in their natural relations and correct proportions; otherwise the tube may easily be made too long. SAXINGER (Z).

Pallin, G.: Carcinoma of the Hepatic and Common Bile Duct and Its Surgical Treatment (Das Carcinom des Ductus Hepatico-Choledochus und seine chirurgische Behandlung). *Beitr. z. klin. Chir.*, 1920, cxxi, 84.

The author reports 52 cases of carcinoma of the hepatic and common ducts described in the Swedish literature. He distinguishes between carcinoma of Vater's papilla, of the common duct, of the juncture of the ducts, and of the hepatic duct. He gives statistics as to the number of males and females with carcinoma at these various anatomical sites and the ages of the patients. He gives detailed macroscopic and microscopic descriptions of the carcinomata.

In 11 of the 52 cases the so-called white bile was observed. Generally a few days after the obstruction to the flow has been removed the bile regains its normal color in such cases. One unusual case was a case of papillomatosis of the common duct.

No definite relationship between stone and carcinoma was determined. One of the chief symptoms of carcinoma is icterus. The other symptoms are described but nothing especially new is brought out. The diagnosis cannot be made definitely.

The treatment is a palliative or radical operation. The results of both forms are extraordinarily poor as in even the simplest palliative operation the mortality is 75 per cent. The author reviews the radical operations described in the literature. Among 44 cases a recovery resulted in 23. These figures are much better than those for the palliative operation, but only especially favorable cases were selected for the radical operation. Of the 23 cured patients, however, only 1, whose case was reported by Koerte, remained free from recurrence for as long as six years. In spite of these very poor figures the author believes operation is justified in view of the uncertainty of the diagnosis and the absolute hopelessness of any other kind of treatment. He gives the histories of 4 cases of carcinoma of the common duct which were treated by radical operation. Death resulted in all. ROST (Z).

Sweetser, H. B.: Injury to the Bile Ducts and Methods of Repair. *Ann. Surg.*, 1921, lxxiii, 629.

The author calls attention to the seriousness of interference with the normal flow of bile into the intestine. With the exception of cases of obstruction caused by the pressure of malignant tumors, this interference is due to: (1) stenosis of the ducts following deep ulceration, (2) the pressure of adhesions, and (3) intentional or accidental division of the common duct during cholecystectomy. One hundred and ninety-five cases of such accidents have been collected by various writers. Their frequency is related in all probability to the frequency of congenital abnormalities in the duct region and the tendency of surgeons to perform cholecystectomy instead of cholecystostomy.

The author reports two cases. In the second case, in the second operation after a cholecystectomy which had been followed by symptoms of interference with the common duct, the cystic duct was found only after a search through a dense mass of adhesions. A No. 17 catheter was passed an inch into the duct and held in place by a chromic gut suture. The other end of the tube was fastened in the duodenum which, after mobilization, was opened without any attempt at the formation of a valve. The omentum was tucked around the joint and the rubber dam drains were carried down to either side of the anastomosis. The tube was passed with the stool on the fourteenth day. The patient made a good recovery. In a letter received over a year after the operation she stated that she was in excellent health and the stools were normal in every respect.

In the author's opinion failures in bile-duct anastomosis are due to stenosis at the point of union or to an ascending cholangitis and abscesses of the liver. For cases in which it is apparently impossible to approximate any part of the stomach or duodenum to the duct, a number of methods have been devised to bridge the gap. The most successful of these has been the employment of a rubber tube, that portion of it which occupies the gap being covered

with contiguous peritoneum or the omentum. Attempts have been made to bridge the gap by means of autogenous grafts, the tissues used being the appendix, pieces of fascia, and veins, but in animals these have failed invariably. In other attempts the biliary fistulous tract or a loop of jejunum has been used. In a few, the hiatus was at the liver surface and there was no duct available for anastomosis. In such instances a hepato-tomy or hepato-enterostomy was done, but with very meagre success.

FREDERICK CHRISTOPHER, M.D.

Crile, G. W.: Special Points in the Surgery of the Gall-Bladder and Ducts. *Illinois M. J.*, 1921, xxxix, 401.

By animal experiment and clinical observation the following facts have been established:

1. At autopsy in certain cases in which the patient declined rapidly after the first day following an operation for gall-bladder pathology and died three, four, or five days later no demonstrable lesion is found.

2. Irrespective of its cause, exhaustion produces certain changes in the cells of the brain, liver, and adrenals.

3. The removal of the liver causes rapid disintegration of brain cells which cannot be distinguished from the disintegration produced by any other cause.

4. The liver cells of animals kept alive by artificial respiration after decapitation do not show degeneration.

5. In conditions of stimulation the conductivity of the brain is increased while the conductivity of the liver is decreased. In exhaustion the reverse is true.

6. By means of sensitive thermocouples it can be shown that every change in the condition of an animal is accompanied by a change in the temperature of the brain. In normal animals the liver appears to have the highest temperature. After complete ligation of the liver, the brain temperature falls until the animal dies.

7. Hæmorrhage and ether anaesthesia cause progressive lowering of the temperature of the brain and liver. The length of life after excision of the liver is almost the same as the time an animal is able to live under ether anaesthesia. Surgical trauma produces changes in the brain temperature in proportion to the degree of trauma.

8. Under light gas-oxygen anaesthesia-analgesia the temperature of the brain remains practically normal. Deeper gas-oxygen anaesthesia causes a fall in the brain temperature but this is not as rapid as that occurring under ether anaesthesia. The administration of hot water by mouth, the application of hot packs, and elevation of the feet cause an immediate rise in the brain temperature.

In cases requiring gall-bladder surgery there are many factors at work which are apt to reduce the internal respiration of the liver cells (indirectly the important influence of the liver on the brain).

These factors predispose to so-called "liver shock." Briefly they are: infection, diminished nutrition, loss of water equilibrium due to the nausea of jaundice, lowered blood pressure, and back pressure of the bile.

The practical application of these observations to gall-bladder surgery is the careful elimination of all factors tending to reduce liver function and the use of pre-operative and postoperative measures known to combat these influences. Analgesia or anaesthesia should be induced with gas-oxygen and the wound infiltrated with a local anæsthetic to protect the brain. Long incisions should be made to obtain exposure without trauma, and cooling of the viscera should be prevented by the use of warm pads. The liver should be handled as little as possible. After the operation the application of heat to the entire abdomen is indicated. In cases of low blood pressure or secondary anæmia, blood transfusion is necessary. Water should be given liberally by the method best suited. By these measures a crisis will be prevented.

In conclusion the author states that while thus far the studies reported are suggestive rather than conclusive, nevertheless whatever fundamental law underlies the action of the measures indicated, the mortality rate of operation on the gall-bladder and ducts has been reduced by their application from 6.2 to 1.6 per cent. J. J. LEBOWITZ, M.D.

Deaver, J. B.: Jaundice. *Med. Rec.*, 1921, xcix, 639.

Jaundice is a symptom, not a clinical entity. It may be due to: (1) obstruction of the ducts caused by stones, tumors, inflammation, etc.; (2) infectious processes apparently not involving the liver, such as pneumonia, typhoid fever, malaria, yellow fever, etc.; (3) toxins, such as arsin, phosphorus, etc.; (4) physiological conditions such as those causing icterus neonatorum; and (5) psychic or emotional causes.

Extended experiments and clinical studies by Minkowski, Naunyn, Rost, Brulé, and others have demonstrated a close relationship between hæmolytic jaundice and the behavior of the liver cells. In this condition rupture of the capillaries of the bile passages occurs as in obstructive jaundice and causes a thrombosis of the capillaries which may be regarded as the immediate cause of the jaundice.

Other experiments and observations prove a close relationship between the liver and gall-bladder lymphatics and indicate that ascending infection is an important factor in jaundice (Brulé). These findings therefore constitute an additional argument for cholecystectomy.

According to French authors, the liver cells are probably affected also in the milder types of catarrhal jaundice. Dissociated jaundice is the type supposed to be due to the separation of the bile salts from the bile pigment, the salts entering the blood stream alone. In "complete jaundice" all of the bile elements are present in the blood. In

hæmolytic jaundice bilirubin is present without the salts when it is formed extrahepatically. The latter is termed "renal dissociation icterus."

The symptoms and probable pathology of the following different grades of jaundice are discussed:

1. A mild catarrhal jaundice which is usually painless, associated with only mild symptoms, and probably due to a cholangitis, often a mucous obstruction.

2. A more acute jaundice with severe colicky pains, due probably to obstruction in the bile ducts.

Both of these types will usually yield to medical treatment, but the latter as a rule recurs and damages the tissues. After a second attack the question of interval operation should be seriously considered.

3. Jaundice due to malignancy, which was present in 15 per cent of the cases. This is not easily detected, the duodenal bucket and other tests being of little aid. Fifty per cent of the cases of malignant jaundice are due to cancer of the liver, and the rest to cancer of the pancreas, gall-bladder, and ducts.

4. Hæmolytic jaundice acholuric in character and associated with enlargement of the spleen and anæmia which may be paroxysmal and vary in intensity. There are two types: (1) the congenital type, which may develop as the subject grows older, and (2) the familial type, which is more common and present in varying degrees in different members of the same family.

5. The jaundice of Hanot's cirrhosis. This is closely allied to the hæmolytic type. Splenectomy in hæmolytic jaundice is often indicated as bilirubin is formed also in the spleen.

6. Surgical jaundice following operation. This is due either to an extension of infection or injury of the ducts. It may be avoided if the anatomy is well known and operation is not performed with undue haste. Occasionally it is due to clamping of the ducts in an attempt to control bleeding from the divided cystic artery. M. H. HOBART, M.D.

Ballin, M., and Saltzstein, H. C.: A Pancreatic Cyst Following Cholecystectomy. *J. Am. M. Ass.*, 1921, lxxvi, 1484.

The case reported by the authors showed clinically pancreatitis, cholelithiasis, cholecystitis, and, subsequent to cholecystectomy, the development of a pancreatic cyst. In June, 1920, the patient had an attack of severe epigastric pain which extended down the left side of the abdomen and radiated to the right and to the back. A month later it occurred again but became well localized to the right upper quadrant. A third attack was experienced a month after the second.

After a period of a month, in which the disease was apparently quiescent, the gall-bladder was removed. It showed a thickened, oedematous, and gangrenous wall and contained stones and pus. The common duct was exposed, but no stones were found within it. One gauze drain and one rubber drain were placed down to the stump of the cystic duct.

Recovery followed apparently without incident but two days after the patient left the hospital he was again seized with sharp epigastric pain which radiated down to the iliac region where it became localized and persisted for twenty-four hours. Two weeks later there was a similar but sharper attack. October 15 he began to have lumbar pain and noticed a round tumor forming in the mid-epigastrium. He noted that the more food he took the more his back ached. After his abdomen began to swell he noted that the sharp attacks of pain no longer occurred.

An operation was performed December 1, 1920. The stomach immediately appeared in the incision, which was made in the midline between the xiphoid process and the umbilicus. The stomach was flattened between the tumor and the anterior abdominal wall. The gastrocolic ligament was incised in a vessel-free area and the cyst was punctured with a trocar. Four quarts of a thin, brownish fluid were removed. A large tube was sewed into the cyst and the abdominal cavity protected by means of strips of gauze about the tube.

The fluid was neutral to slightly acid and contained bile pigments and bile acids. Amylase was actively present; trypsin was present but weaker. Recovery was uneventful.

The authors state that obstruction to the outflow of the pancreas is the cause of most of the chronic pancreatic cysts coming to operation. This obstruction may be in the excretory duct or due to a combination of compression from without and obstruction within. The most frequent cause is chronic interstitial pancreatitis.

In the case reported pancreatitis was probably present before the cholecystectomy as the patient had often complained of pain on the left side. The pathologic sequence was doubtless as follows: (1) acute purulent cholecystitis and cholelithiasis with concomitant severe pancreatitis, (2) cholecystectomy followed by interference with the biliary outflow, and (3) recurrence and accentuation of pancreatic inflammation with breaking down of pancreatic tissue followed by leakage of pancreatic secretion and bile into the peritoneal cavity, i.e., the pancreatic cyst.

The authors conclude that in cases of pancreatitis complicating gall-bladder disease, especially if there is pronounced infection, one of two methods should be employed: (1) cholecystectomy with drainage for several weeks, or (2) cholecystectomy with additional drainage of the common duct.

G. HAVEN MANKIN, M.D.

MISCELLANEOUS

Eccles, W. M.: The Early Diagnosis of Acute Abdominal Affections. *Brit. M. J.*, 1921, i, 663.

Acute thoracic conditions belong to the physician, acute abdominal conditions to the surgeon, but both of these and the responsibility of the diagnosis and treatment belong to the general practitioner. Acute

abdominal affections generally require surgical emergency measures and from the first the possibility that surgical treatment may be necessary should always be borne in mind. It is essential for the medical attendant to remember the several conditions which might be present in any given case. The percentage frequency of acute abdominal condition is as follows: acute appendicitis, 70.7 per cent; intestinal obstructions, 18.1 per cent; perforations, 7.2 per cent; cholecystitis, 2.4 per cent; torsion of pedicles, 1.1 per cent; and acute pancreatitis, 0.5 per cent.

In addition, one must consider colic and poisoning and, in the adult female, rupture of an ectopic gestation, acute salpingitis, and septic endometritis. An acute basal pleurisy or the pain prior to the vesicular eruption in "shingles" may also simulate an acute condition of the abdomen.

The patient may present the abdominal facies, an anxious expression due to the intensity of the abdominal symptoms. Vomiting occurs because the stomach is directly or reflexly disturbed. The pulse steadily increases and has no relationship to the temperature. The temperature rises because of inflammation or falls because of collapse. Abdominal pain with tenderness is usually present but ranges in intensity according to the patient and the lesion. Muscle rigidity is a valuable indication, especially if localized.

Over 70 per cent of the cases of acute abdominal conditions are cases of acute appendicitis. Every case should be diagnosed and treated early. The mortality is still too high because of delay in the diagnosis and treatment. The left side should be examined first to give confidence to the patient, and the abdomen should never be approached with cold hands. A rectal examination should always be made. Bladder symptoms may be present if the appendix lies over the brim of the pelvis.

In suspected cases of intestinal obstruction the ordinary hernial sites should be examined for possible strangulation. Internal strangulation and intussusception are the next most common causes. If the obstruction is due to volvulus, a tumor is usually present. The signs and symptoms are similar and usually characteristic. The treatment is surgical. Early operation not only confirms the diagnosis, but as a rule promotes cure.

Nothing produces a more acute abdomen than the perforation of a hollow viscus. The stomach, duodenum, gall-bladder, or the appendix may give way, and its contents, passing into the peritoneal cavity, will produce the most alarming signs and symptoms. It is then best to explore rather than to wait for advanced signs such as loss of liver dullness, free fluid in the abdomen, and general peritonitis.

In cases of cholecystitis there is often a history pointing to gall-stones, which sometimes is associated with jaundice, pain in the right hypochondrium radiating to the scapular region, vomiting, a rise in the temperature, acceleration of the pulse, chills, and muscular rigidity high on the right side. If all

these are present, a positive diagnosis can be made and operation is indicated to save life.

Torsion of the pedicle of a tumor or organ causes immediate interference with the circulation in the attached structure. This may occur in an ovarian cyst, pedunculated fibroid, floating kidney, or wandering spleen. The usual symptoms of an acute abdomen are present and the tumor or organ is generally palpable.

Acute hæmorrhagic pancreatitis is usually due to rapid infection by way of the duct or blood stream. As a rule the patient is disabled shortly after the onset of symptoms because of shock caused by hæmorrhage into the pancreatic tissue. Cyanosis of the face and extremities and marked dyspnoea are prominent features characteristic of this type of acute abdomen. Loewe's adrenalin test may help. Abdominal exploration should not be delayed as this is the only means of saving life.

Intestinal, renal, and biliary colic may give extreme pain and distress. These are differentiated from the other acute conditions by the fact that the symptoms are not so severe and the pain is relieved by pressure. If the pain is increased by pressure it is best to regard the condition as a menace to life and treat it accordingly.

In the diagnosis of poisoning the history is the chief aid.

MERLE R. HOON, M.D.

Salzer, M.: A New Diagnostic Sign in Acute Inflammatory Conditions of the Abdomen.
J. Am. M. Ass., 1921, LXXVI, 1498.

The accurate diagnosis of acute inflammatory conditions of the abdomen presents such great difficulties at times that the surgeon is at a loss where to make his incision. This frequently necessitates handling an appendix through what was originally a gall-bladder incision, and a gall-bladder through what was originally an appendix incision.

The author mentions a sign brought to his attention about four years ago which he believes makes for more accurate localization of the seat of trouble. At the time he first noted it he was called upon to give the anæsthetic for a case in which two internists had made a diagnosis of acute appendicitis with possible abscess. The entire right side of the abdomen was rigid, painful, and tender on palpation. The leucocyte count was high and the patient's condition poor. The consulting surgeon was inclined to regard the condition as an acute gall-bladder infection.

The anæsthetic was nitrous oxide-oxygen. Before the patient was completely anæsthetized the surgeon decided to make another examination. He first made pressure over McBurney's point and there was no response. As soon as he pressed over the gall-bladder region, however, there was a distinct catch in the respiration, some local resistance, some contraction of the eyelids, and other evidences of pain. In the examination of other parts of the abdomen no such response was elicited.

The incision was made over the gall-bladder region and a moderately distended gall-bladder which was suppurating was delivered. The appendix was found to be perfectly normal.

All subsequent acute abdominal cases were examined with the patient partially anæsthetized and in several hundred instances the sign described was found to be most reliable. The catch in the respiration was the constant part of the sign. The author states that although nitrous oxide-oxygen anæsthesia was used in the majority of the cases, the sign holds good when ether is employed.

G. HAVEN MANKIN, M.D.

Maylard, A. E.: Abdominal Pain: Its Mechanism and Clinical Significance. *Brit. M. J.*, 1921, i, 731.

The subject of reflex abdominal pain is discussed and it is urged that the final distribution of the spinal nerves and their communications be studied in order that a full understanding of this important diagnostic aid may be obtained. Pain in the epigastrium and scapular regions in chronic gastric ulcer is explained by the communication between the sixth intercostals and the splanchnics through sympathetic ganglia, the splanchnics conveying impulses from the solar and celiac plexus. Pain in the shoulder in cases of gall-stones is attributed to the connection between the hepatic plexus, the phrenic ganglion, and the phrenic nerve which connects the phrenic ganglion with the fourth cervical root.

By excitation of the fifth to the ninth roots, which sends impulses traveling up the large splanchnics from the solar plexus by way of the aortic and inferior mesenteric plexus, pain in early appendicitis may be referred to the epigastric and umbilical areas. The localized pain which comes later is probably due to inflammation of the parietal peritoneum.

Abdominal pain may be caused also by undue excitation of the posterior horn cells, as in tabes dorsalis, or by stimulation of the spinal afferent nerve in any part of its course, as in pleuropneumonia and tuberculous caries.

A case of appendicitis is cited in which it was thought that stimulation of the phrenic nerve by a subdiaphragmatic peritonitis extending upward from the diseased appendix caused pain over the right shoulder the most prominent symptom.

No explanation is given of the character of pain, except that the type known as intermittent colic is peristaltic in origin.

The degree or severity of pain depends largely on the patient's toleration. It may be influenced also by the excitability of the cells. The latter may vary in certain states as in fever or anæmia. Maylard believes that hypersusceptibility of cells on the side opposite that of the lesion may account for the occurrence of the renorenal reflex. Increased excitability of contiguous cells may account for diffuse pain.

J. W. ROSS, M.D.

Slesinger, E. G.: Two Unusual Cases of Abdominal Tuberculosis. *Brit. M. J.*, 1921, i, 703.

The author reports two cases of abdominal tuberculosis which were unusual on account of the difficulties in the diagnosis and the rarity of mesenteric abscess at the ages at which it occurred in these instances.

CASE 1. An infant, aged 5 months, had been ill for ten days with diarrhoea; the stools were green and foul, but did not contain blood. The child had vomited four times before it was brought to the hospital. The pulse was feeble, 160, and the temperature 102 degrees F. The abdomen was tensely distended. The condition was diagnosed as pneumococcal peritonitis and a laparotomy was performed under spinal anaesthesia. A general peritonitis with perforation of the bowel and a mesenteric abscess not associated with the perforation were found. Autopsy the next day showed extensive tuberculous

ulceration of the small intestine with perforation of one ulcer and a mesenteric abscess in relation to a ruptured tuberculous caseating gland.

CASE 2. A man, aged 34, had complained of pain in the iliac fossa for three weeks and extreme constipation without vomiting. The pulse rate was 100 and the temperature 99.4 degrees F. The abdomen was distended and tender over the left iliac fossa and a firm, easily movable tumor was palpated. The condition was diagnosed as Meckel's diverticulum. Laparotomy disclosed an abscess in the left iliac fossa bounded by the mesentery and bowel, from the wall of which part of a semicalcareous gland was removed. The appendix, which was attached to the mass at the tip, was excised and a well-formed Meckel's diverticulum was separated from the loop of intestine. Following drainage of the cavity the patient made an uninterrupted recovery.

R. W. NICHOLS, M.D.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Wells, H. G.: The Relation of Multiple Vascular Tumors of Bone to Myeloma. *Arch. Surg.*, 1921, ii, 435.

A case of multiple bone tumors is described in which the gross appearance of the neoplasms at autopsy suggested the so-called hæmorrhagic sarcomata or malignant hæmangio-endotheliomata of bone as the bones were replaced by masses of soft, red, jelly-like tissue. Microscopic study of the tumors showed that they consisted chiefly of wide blood channels lined with one or several layers of cuboidal cells separated by a small amount of very cellular oedematous connective tissue. In some places, however, they had broken through the bone into the adjacent tissue and where they were relieved from pressure were found to show the characteristics of multiple myelomata, despite the fact that intra-osseous tumors seldom show such a structure.

This case illustrates the fact that multiple myelomata may undergo changes disguising their original character almost completely, if not completely, and it is probable that many cases of vascular bone tumors, especially those of multiple tumors, have really been cases of multiple myelomata almost entirely transformed through hæmorrhagic necrosis. The following explanation is suggested for the occurrence of this transformation in bone tumors:

Because of the strangling of the tumor growth by the unyielding bone shell, necrosis with subsequent hæmorrhage occurs within the growth. When the clot organizes it cannot shrink because of its attachment to the bone structure. As a result, the blood channels become enlarged, form the bulk of the tumor, and cause it to resemble a vascular tumor.

Hobo, T.: The Pathogenesis of Acute Hæmatogenous Osteomyelitis with Regard to Vital Staining (Zur Pathogenese der akuten hæmatogenen Osteomyelitis, mit Berücksichtigung der Vitalfärbungslehre). *Acta scholæ med. univ. imp., Kioto*, 1921, iv, 1.

Hobo studied the vascular system of the bones by means of vital staining with India ink and carmine. The arteries ascend to the epiphyseal cartilage where they pass into the dilated venous capillaries which arch over and descend. As the arteries and arterial capillaries are much smaller in caliber than the veins and venous capillaries, the venous circulation is very slow. Where the circulation is slowed at its passage from the arterial capillaries into the venous capillaries the deposition of bacteria is favored. This occurs especially at the beginning of the epiphyseal cartilage where the vessels arch as at this point there is considerable dilation of the capillaries.

Bacteria or other substances entering the circulation are deposited chiefly in the liver, spleen, and bone marrow. They are deposited throughout the marrow of the bones as well as at the metaphysis, but in the marrow they are destroyed by the capillary endothelium and absorbed. The leucocytes, marrow cells, and reticulum cells also take part in their destruction. In the marrow it is difficult for a suppurative process to become established, but in the metaphysis it is difficult for the leucocytes to assemble to overcome an infection.

The apex of the marrow canal is surrounded by cartilage and bone. There is little tissue reaction and no sign of leucocytic infiltration to overcome the infection. As the bacteria grow and increase, they destroy the capillary walls and come into direct contact with the epiphyseal cartilage where they find a favorable soil for development. The presence of bacteria in the epiphyseal cartilage,

therefore, is generally the starting point for osteomyelitic infection.

Three plates showing histologic pictures of bone and a bibliography of thirty-eight titles are given.

A. G. MORGAN, M.D.

Allison, N.: Tuberculosis of Bone: Results of a Study. *Arch. Surg.*, 1921, ii, 593.

This article is the report of a pathologic study of 50 cases of bone and joint tuberculosis. All cases in which there was any doubt regarding the diagnosis were eliminated. The localization of the infection was as follows: spine, 3 cases; hip, 8; knee, 16; shoulders, 6; ankle and tarsus, 5; wrist, 1; elbow, 2; trochanter major, 1; trochanter minor, 1; tibia, 2; ulna, 1; humerus, 1; sternum, 1; malar bone, 1; rib, 1. The atypical localization in several cases might surprise one who had the conventional idea that the disease occurs only at certain points.

In most of the cases studied the joints were involved and in every case there was involvement of bone. The author is led to the conclusion that the disease is primarily a disease of the bone. Although it is not certain where the original infection occurred in all of the cases reviewed, it is certain that the bone became the chief seat of the process. No evidence was found of primary synovial involvement and no case of pure tuberculous synovitis. There was abundant evidence, however, to show that a primary focus in the bone progresses to the joint and extra-articular tissues.

Forty-one of the 50 cases are grouped as cases of bone tuberculosis with joint involvement. The structures involved were the cancellous portion of the bone, the articular cartilage, the synovia, and the joint capsule and ligaments. A typical case is as follows:

A diagnosis of tuberculosis of the shoulder was made on clinical findings and the head of the humerus was excised. Microscopically it showed extensive erosion of the cartilage at the margin and a deep depression at the center of the surface. This resembled a pure tuberculous synovitis, but when the decalcified head was sectioned, the primary focus was found in the center of the spongy bone with evidence of a break through to the cartilage surface. Microscopic examination showed also that the process was of the infiltrating type. There was very little fibrous reaction, a fact which indicated that the marrow had no resistance. The various processes here observed, which made up the typical picture of bone tuberculosis with joint involvement, were: (1) tubercle formation, (2) caseation, (3) atrophic changes, (4) cartilage destruction, (5) infiltration changes, (6) synovial tuberculosis, (7) practically no effort at repair.

Eleven other cases of this group are described and the conclusion is reached that "bone tuberculosis has its origin, in the great majority of instances, in the cancellous bone, and its extension to the neighboring tissues with their individual characteristics

of reaction to infection explains the various types of the disease."

The cases comprising the second group, cases of bone tuberculosis without joint involvement, are regarded as atypical tuberculous lesions. This form is uncommon, at least in America. A representative case of this type was the following:

A child 5 years of age exhibited lesions in the right and left ulna and left tibia resembling chronic pyogenic osteomyelitis. The Wassermann test was negative. The tuberculin test was positive. One or two small white bodies resembling tubercles were found in tissue from the medullary cavity. Microscopic examination showed caseating granulation tissue surrounding necrotic trabeculae and rapidly proliferating new bone near the mass of granulations. There was also subperiosteal new bone formation. One specimen showed a tuberculous focus in the compact bone of the shaft, and another, tuberculosis of the periosteum with new bone growth. Although some of the process was distinctly of the hypertrophic type, the destructive type predominated.

It is confusing to describe bone tuberculosis and joint tuberculosis separately. Both are the same process, the variations being due to the character of the tissues infected. The author suggests that, in teaching, the occurrence of tuberculosis in the shafts of bones be given more attention than is usually devoted to it.

W. A. CLARK, M.D.

Fisher, A. G. T.: Loose Bodies in Joints. *Lancet*, 1921, cc, 839.

The author divides loose joint bodies of cartilage and bone into three groups: (1) those occurring in connection with a general pathologic process such as osteo-arthritis, tabes, tuberculosis, or acute infectious arthritis; (2) those occurring in otherwise normal joints; and (3) synovial chondromata.

In osteo-arthritis the loose body is usually a detached osteophyte. As a rule there is only one body, but others derived from the synovial fringes may also be present. The loose body may be completely detached or adherent by a pedicle to the joint margin. It is pyriform in shape with the pointed extremity less thickly covered with cartilage. The peripheral zone consists of fibrocartilage with a few uniformly distributed cells. The fibrocartilage is surrounded by fibrous tissue showing flattened cells, the perichondrium. The cells of the bone in the center are dead and the lacunae empty.

Epi-articular ecchondroses may have their origin in local hyperplasia from the cartilage covering normal bone. In tabes the bodies are large and bone is formed in the planes of connective tissue between the capsule and the synovial membrane. Loose bodies are rarely formed in cases of tuberculosis. They are slow to develop and are wedge-shaped because of interference with the circulation. In the knee they are derived from the femoral surface. In cases of acute arthritis they vary in size from flakes of cartilage to bony sequestra. When

the epiphysis is intracapsular they may occur as the whole articular end of the bone.

The type of loose body found in normal joints is most often seen in males between 15 and 25 years. The knee is most commonly affected; next in order of frequency are the elbow, the shoulder, the hip, the ankle, and the wrist. The classical form of loose body is circular or oval, the size of an almond, with a rough plane surface and a smooth convex surface. The body is usually single and may be free or adherent. The condition may be bilateral, and in most cases there is a history of trauma.

When a loose body has been detached recently microscopic examination shows the cartilage and bone to be living. When less recently detached the bone cells are dead, but the cartilage usually shows marked proliferative changes. If the detachment is incomplete or if secondary adhesions have formed, new bone may develop. Cases in each group and examples of loose bodies following direct and indirect trauma are cited.

Loose bodies may be derived also from the inter-articular fibrocartilage, usually from the anterior end of the internal cartilage of the knee. In one case the body originated in the epiphysis of the external condyle of the humerus.

The synovial chondromata are intimately connected with neoplasms. They originate from the cartilage cells in the synovial villi.

Deductions as to the mode of origin of these bodies are drawn from the pathologic, clinical, and experimental data. These all tend to show that trauma is the exciting cause. The interval between the time of injury and the onset of symptoms may be explained in many instances by the incomplete detachment of the body or its subsequent attachment elsewhere. It is only when it is free to impinge between the joint surfaces that the typical symptoms of pain and locking are produced.

In experiments on rabbits in which an artificial loose body was formed and left in the joint for five weeks, examination at the end of that time showed the cartilage to be healthy but that many of the bone cells had died after the detachment. The resemblance between the body in this experiment to the loose bodies found in clinical cases of the condition known as osteochondritis is such as to suggest that in the latter the bone cells die only after detachment.

Cartilage cells in nearly all cases retain their vitality. The bone cells, when separated from their blood supply, do not. The author suggests the advantage of preserving the periosteum and perichondrium in bone grafting as an aid to the establishment of vascular connection.

The treatment indicated in all cases is removal of the body. The prognosis is good in the young and middle-aged when the joint is otherwise normal. In chondromatosis the results are good unless the condition is progressive. Wide incisions are advised in order to allow exploration of the joints.

J. I. MITCHELL, M.D.

Krogius, A.: The Pathogenesis of Dupuytren's Contracture of the Fingers (Studien und Betrachtungen ueber die Pathogenese der Dupuytrenschen Fingercontractur). *Finska laek-saellsk. handl.*, 1920, lxii, 489.

From a study of the material of the Surgical Hospital of Helsingfors for the years 1888 to 1920 Krogius came to conclusions somewhat different from those generally accepted. Among his 22 patients he found the condition beginning in the second decade of life in 2, in the third decade in 6, in the fifth decade in 4, and after the fifth decade in 6. Eighteen of the patients were males, and 4 were females. Three of the latter were young girls in whom the condition was bilateral.

Krogius has discovered one family in which a man with Dupuytren's contracture had 15 descendants with the same condition. Kajava found flexor brevis muscles of the hand in mammals, a fact which suggested to the author that contraction of the palmar fascia might be due to degenerated remains of anlagen of such muscles. According to Kajava, these muscles are present more on the radial side in the lower mammals, but in the higher mammals they are found exclusively in the fifth or the fourth and fifth fingers. Graefenberg found in a human embryo the anlage of such a flexor brevis muscle which later blended with that of the flexor digitorum sublimis.

The palmaris brevis muscle, which is innervated by the ulnar nerve, arises, according to Kajava, from remnants of these flexor brevis muscles of the hand. In histologic specimens of palmar fascia of the new-born Krogius found in the connective tissue islands of striated muscle tissue which evidently change later into connective tissue.

The palmaris brevis is inserted by means of tendon fibers into the skin; similar fibers pass from the palmar fascia to the skin.

Krogius examined 13 specimens of Dupuytren's contraction microscopically. In none of them was there any small-cell infiltration or sign of inflammation. In old cases he noted only connective tissue poor in cells. The latter were arranged like those in the connective-tissue cords of the sternocleidomastoid in wry-neck. In recent cases he found tissue rich in cells with large nuclei. In specimens of different ages it can readily be seen how the tissue becomes poorer in cells as it grows older and the connective tissue bands become denser.

Krogius believes that the tissue rich in cells is embryonic, fundamental tissue which normally would have formed muscle or tendon tissue. In his opinion the only cause of Dupuytren's contraction is an embryonic anlage. PORT (Z).

FRACTURES AND DISLOCATIONS

Enloe, N. T.: Plaster-Cast Immobilization of Fractures Prior to Open Operation For Their Reduction. *California State J. M.*, 1921, xix, 199.

The author states that while many fractures reduced by open operation cannot be held in proper

position during the application of the plaster cast unless they are held together by some foreign material, they will usually remain in position without the introduction of foreign materials if the operation is performed through a window of an already hardened cast.

In the method suggested the site of the fracture is held firmly after exposure by a cast extending above and below the nearest joints. The window in the cast is cut sufficiently large for freedom in operating. The ends of the fragments can be easily manipulated by the use of forceps and by manipulation of the limb above and below the cast. There is little danger of injury to the soft tissues. The cast should be applied several days previous to the operation in order that the patient may become accustomed to it. Another advantage of the method is that the field can be maintained sterile and surgically clean with greater ease than is the case when other methods are used.

The author describes the technique employed in preparing the field of operation. Soap and water are used first, and then gauze saturated with compound tincture of benzoin. Following this, first sheet cotton, and then the cast is applied.

On the morning of the operation the window is removed, a dental rubber dam is tucked around the edges, and the field of operation is treated with tincture of iodine and alcohol. After the operation tincture of iodine is again applied and a dressing of compound tincture of benzoin is left on for ten days.

The author summarizes the advantages of the method described as follows: (1) it permits easy reduction during the operation, (2) the danger of wounding the soft tissues is eliminated, (3) the introduction of foreign materials is rendered unnecessary, (4) slipping of the dressings over the field of operation is greatly diminished, and (5) postoperative comfort is assured. F. G. MURPHY, M.D.

Boss, W.: The Treatment of Presternal Dislocation of the Clavicle (Die Luxatio claviculae praesternalis und ihre Therapie bei einmaligem und chronisch wirkendem Trauma). *Beitr. z. klin. Chir.*, 1921, cxxi, 679.

Dislocations of the clavicle are comparatively rare. The most frequent form is the presteral dislocation. This occurs usually in children or in men of middle age. It is generally caused by sudden trauma but in five cases was due to chronic trauma.

The nature of the symptoms depends upon the cause. Cases due to sudden violence are characterized by severe local pain on pressure, a copious effusion of blood, and considerable interference with the movement of the shoulder. In those in which the condition comes on gradually as the result of chronic trauma there is little or no pain, no effusion of blood, and little or no interference with the motion of the arm. Secondly there are symptoms due to injury of the nerve plexus which demand operation.

Dislocation from chronic trauma occurs only in young persons because in such cases the elasticity of the joint ligaments is slight and they are over-distended and torn by the persistent striking of the bone with great force on a definite point in the joint capsule.

Conservative treatment is not adequate. Of the operative methods that of Koenig and Meyer is best. This was modified to advantage in a case described by Gottstein. Gottstein took the flap of periosteum which is designed to hold the clavicle in place from the clavicle instead of the sternum and to secure greater firmness placed a silk button suture between the sternal and clavicular portion of the pectoralis major and the aponeurosis of the sternocleidomastoid. The result was very good. Three case histories and the descriptions of two operations are given. SIMON (Z).

Séjournet, P.: An Apparatus for the Treatment of Fracture of the Humerus Which Does Not Interfere with the Mobility of the Elbow and Shoulder Joints (Un appareil pour fractures de l'humérus assurant la mobilité du coude et de l'épaule). *Rev. de chir.*, Par., 1921, xl, 73.

The appliance described consists of an aluminum framework of three splints with circles to be clasped around the arm above and below the fracture and a crutch-head shaped to fit into the apex of the axilla and pass around and rest against the posterior surface of the scapula. The crutch-head is attached with a movable joint to allow normal movement of the shoulder. As the lower end of the splint comes just above the elbow, both the elbow and shoulder are free. Rubber strips permit the application of weights for counter-extension, and when the device is in place the arm is surrounded by a sheath of metal and rubber which adapts itself automatically to the size of the arm as the swelling subsides.

Numerous illustrations of the splint and its method of application are given. The author has used it in 32 cases with excellent results. The histories of these cases are given. The special advantage of the device is that it permits early exercise of the muscles and joints which is known to be of great importance in bone repair. The prolonged after-treatment of the muscles required following ordinary fracture treatment is unnecessary. In the cases reported consolidation took place promptly even when there was reason to fear that it might be slow on account of the great mobility of the fragments and the patient's age.

In 13 fractures of the upper end of the humerus the average time required for consolidation was twenty-four days, the maximum thirty-one days, the minimum nineteen days. In 19 fractures of the diaphysis the average time was thirty-two days, the maximum forty-eight days, and the minimum twenty-four days. Of course the patients should be carefully followed up and active movements of the arm should be begun as soon as possible. Most of the author's patients were able to resume their

work within a few days after the appliance was removed from the arm. A. G. MORGAN, M.D.

Peters, W.: The Typical Fracture of the Radius in Young Persons (Die "typische Radiusfraktur" im jugendlichen Alter). *Beitr. z. klin. Chir.*, 1921, cxxi, 439.

While the typical cause of fracture of the lower end of the radius is a fall on the palmar side of the hand when it is flexed backward, there are a considerable number of exceptions. The author had the opportunity to re-examine forty-six cases of fracture of the radius in young persons, some of which occurred as long as twelve years previously. Only eleven were displacements of the epiphysis. Often in connection with such displacements there were lines of fracture extending into the cartilage or fragments were broken off. In one case in which the epiphysis was loosened it was displaced toward the palmar side. This occurred in a fall on the hand when it was flexed toward the palm. In some cases the styloid process of the ulna had been broken off. In one case the epiphyses of both the bones of the forearm had been separated.

By far the most frequent form of injury of the radius in the young is a transverse fracture above the epiphysis. In one case there was displacement of the epiphysis of the ulna toward the back of the hand. Besides transverse fractures there was more or less extensive fracturing of fragments from the outer and inner side of the diaphysis; fracture lines ran from the transverse fracture into the diaphysis or several fragments were broken from the latter. There were six cases of fissures. Fractures of the radius were never combined with fractures of the bones of the wrist or with a dislocation of the os lunatum.

All of the cases had healed without any marked abnormalities of the bone, disturbance in growth, or limitation of function. In one case in which the accident had occurred two years previously maximum movement was still accompanied by pain, and in several cases the flexor tendons were fixed as a result of connective-tissue contraction of the tendon sheaths from long-continued effusion. Even in these cases, however, there was no pronounced atrophy of the muscles of the forearm or hand. Arthritis deformans of the wrist joint was not noted in any instance. The oldest patient examined was 26 years of age. SIMON (Z).

Strube, W.: Dislocations of the Fingers at the Metacarpophalangeal Joints and of the Toes at the Metatarsophalangeal Joints (Ueber Fingerluxationen im Metacarpophalangealgelenk und Zehenluxationen im Metatarsophalangealgelenk). *Beitr. z. klin. Chir.*, 1920, cxx, 646.

Dislocations of the fingers at the metacarpophalangeal joints are unusual. The thumb is most frequently involved, then the index finger, the little finger, the middle finger, and the fourth finger. Still more unusual are dislocations of several fingers

at the same time. Dorsal dislocations are less uncommon. These are generally caused by a fall on the outstretched hand; more rarely, by direct violence. There is anterior dislocation only when direct violence forces the finger to the volar side.

Metacarpophalangeal dislocations may be caused also by traction from scars. The diagnosis and replacement are generally easy, but occasionally reposition is rendered more difficult by the interposition of a piece of capsule, a joint ligament, or a flexor tendon. In some cases operative reposition is necessary. Dislocations of the toes are more rare than dislocations of the fingers, but more frequently compound and combined with fractures than those of the fingers. Strube describes the following cases:

Case 1 was that of a 28-year-old criminal. In attempting to get away from his pursuers he fell from the third story of a building on his feet and then fell backward on his outstretched hand, suffering a transverse wound of the palm with backward luxation of the second, third, and fourth fingers at the metacarpophalangeal joint. Reposition and suture were followed by healing by first intention.

Case 2 was a palmar dislocation of the right middle finger of a 68-year-old woman from an unknown cause. As there was free movement of the finger, reposition not attempted.

In Case 3 an injury to the foot in a street railway accident was associated with injuries of the soft parts and tendons, fracture of the tarsal and metatarsal bones, and dislocation of the first to the fifth toes at the metatarsophalangeal joints.

Case 4 was a case of fracture of all five metatarsals and dislocation of the little toe due to a street railway accident. KINDL (Z).

Shoemaker, J.: The Treatment of Long-Standing Dislocations of the Hip. *Surg., Gynec. & Obst.*, 1921, xxxii, 461.

The author reports two cases. The first was that of a young woman, 23 years of age, who gave a history of a severe illness in her tenth year of age which was followed by lameness in the left leg. The lameness had continued to grow worse until the present time. Physical examination showed shortening of the left leg, the top of the left trochanter being 6 cm. above Nélaton's line. The X-ray revealed a dorsal dislocation of the femur.

Reduction of the dislocation was attempted and the leg placed in extension for two weeks with a 6 kgm. weight. Later a Lorenz traction apparatus was applied. When the traction apparatus was loosened strong abduction was made to stretch the adductors and the limb was again extended to repeat the extension. The thigh was then abducted very strongly so that the knee was flat on the table. The head of the femur was thus passed to the front. When the limb was brought toward the midline, the head slipped into its original posterior dislocation position instead of the acetabulum. The manoeuvre was therefore repeated and the limb held in abduction in a plaster of Paris cast. On pal-

pation the head of the femur appeared to be directly over the acetabulum. Six weeks later an X-ray showed it within the acetabulum. The limb was brought down into slight abduction and a second cast applied. On the removal of the cast at the end of six weeks the hip was found to be normal and the patient was able to walk without a limp.

The second case was that of a man aged 61 who was suffering from a recent traumatic obturator dislocation on the left side and a posterior dislocation of the hip on the right side. The dislocation of the left hip was reduced without difficulty. One day later the right trochanter was 4 cm. above Nélaton's line. Manipulation caused little pain. The X-ray showed a flattened acetabulum. An attempt at reduction under an anæsthetic failed. The patient trained himself to walk but had a decided limp. He left the hospital in two weeks. Two months later he re-entered the hospital with increased pain and lameness. The manœuvre used in the previous case was then carried out. The limb was abducted and held in position with a plaster of Paris cast. The X-ray showed the head on the acetabulum. Several casts were applied with gradual decrease of the abduction. One month later the patient left the hospital walking normally.

The author cites several cases of reduction of dislocation of the hip of long standing and questions the advisability of open operation when it cannot be effected in the usual way. He states that the technique should be modified according to the conditions found. When in a case of old dislocation the X-ray shows normal proportions between the head and the acetabulum, the usual method of reducing the dislocation should be tried first. If this fails, the head should be brought to the entrance of the acetabulum with the limb placed in complete abduction after complete flexion. The thigh must be at right angles to the axis of the body, on a level with the symphysis. The manœuvre used in Case 1 should be repeated several times and the leg placed in a position of abduction with the head over the acetabulum. The limb should be then fixed in a plaster of Paris cast. The cast should be left on for a fortnight and the patient then encouraged to bring the leg back to the normal position. If the X-ray shows the head in the acetabulum the patient should be encouraged to walk. The author believes that all old dislocations should be reduced in this manner.

FRANK G. MURPHY, M.D.

Gaugele, K.: The Importance of Avoiding Injury to the Adductors in Treating Congenital Dislocation of the Hip (Schonet die Adductoren! Beitrag zur Einrenkung der angeborenen Hüftgelenkverrenkung). *Ztschr. f. orthop. Chir.*, 1920, xl, 289.

For years Gaugele has observed that when the adductors are very much injured during reposition the result is by no means ideal. He therefore made a special study of the importance of such injury. He refers to the work of Roith who includes in the

adductor group the semitendinosus, the semimembranosus, the biceps, and the quadriceps femoris in addition to the adductors so-called and regards the adductor group as opposed to the abductor group including the glutei, rectus, sartorius, and tensor fasciæ latæ. He gives a tabulated statement of the action of the individual members of the adductor group in their rôle as adductors, flexors, and extensors of the hip and as adductors, abductors, and flexors of the leg.

The muscles most apt to be injured are, first, the gracilis, then the adductors longus, brevis, magnus, and minimus, which in extreme abduction may be torn entirely in two. The site of the tear is indicated by a marked depression. The functional results of injury to the adductors are slight abduction and flexure of the hip with a greater or less degree of abduction of the leg, decreased power and fatigue on slight exertion, especially walking up-hill, and instability of the joint with abduction to an abnormal extent.

The author discusses his cases for the year 1919. In 45 cases there were 64 dislocated hips. In 33 cases (52 per cent) he succeeded in reducing the dislocation without injury of the adductors, and in 22 per cent with only slight injury. In 26 per cent there was considerable injury, but most of these were the cases of older children with an extreme degree of dislocation. Nine of the children were over 6 years of age.

Gaugele therefore states that reposition can be accomplished in most instances without injury of the adductors. Overextension for the sake of attaining primary stability should be avoided. If the proper technique is used in bandaging there is no danger of posterior relaxation. In the cases of older children reposition over the posterior upper and posterior lower edge of the acetabulum is recommended. If injury of the adductors has occurred, it can be overcome by the use of a dislocation bandage which the author describes, and by instructing the parent to make daily movements of adduction with the limb.

JUENGLING (Z).

Rubeli, H.: Fractures of the Neck of the Femur, Especially Intratrochanteric Fracture of the Neck of the Femur (Beitrag zur Kenntniss der Schenkelhalsfrakturen, speziell der Fractura colli femoris endotrochanterica). *Arch. f. klin. Chir.*, 1921, cxv, 388.

The author adds a new group to the classification of fractures of the neck of the femur as given by Kocher which he calls "fractura colli femoris endotrochanterica," meaning a fracture within the mass of the trochanter running in several different planes. As a rule one limb of it passes through the intertrochanteric line, while others run either below the trochanter major or between the trochanters, often breaking off the whole intertrochanteric crest. He gives the following classification:

True fractures of the neck: (1) fractura colli subcapitalis; (2) fractura colli intertrochanterica.

Fracture of the neck in the widest sense: (1) *fractura colli diatrochanterica* (formerly *petrotrochanterica*); (2) *fractura colli endotrochanterica*; (3) *fractura colli subtrochanterica*; (4) combined forms; (5) fracture of the trochanter major alone; (6) fracture of the trochanter minor alone.

The statistical material from the Berne clinic from 1896 to 1917 showed that the average age incidence of fracture of the neck of the femur was 60 to 70 years in women and 40 to 50 years in men. Only in subcapital fracture was the average higher for men, 50 to 60 years.

The most frequent form of fracture is the intratrochanteric in men, and the subcapital in women. The pure diatrochanteric is the rarest form of fracture of the neck of the femur. The combination forms are rare in comparison with the intratrochanteric form. It is only exceptionally that intertrochanteric fracture is not impacted. Adduction seems to be the most frequent position in both intertrochanteric and intratrochanteric fracture.

Operation is indicated in all cases of subcapital fracture without consolidation if the condition of the patient permits. The upper fragment should be removed and the neck reshaped to form a new head. If this is not possible because of the age of the fracture or the patient's poor general condition, the head may be fixed to the lower fragment with nails.

Extension treatment is indicated in impacted fracture. After excision of the head there was ankylosis of the hip joint in the cases reviewed. In cases treated with nails the function of the joint was preserved. In all other forms extension treatment is indicated. If function is interfered with by extracapsular callus normal movement can be restored by removing the callus.

RAESCHKE (Z).

Hohlbaum, J.: The Etiology of Dislocation of the Patella (Ueber die Aetiologie der Patellar-Luxation; ein Beitrag zur Entwicklung der unteren Extremitaet, ihrer Difformitaeten und Gelenke). *Beitr. z. klin. Chir.*, 1920, cxxi, 1.

Hohlbaum gives a critical discussion of the views of different authors as to the etiology of dislocation of the patella. At present it is very generally believed that this dislocation is the result of a congenital predisposition which may be manifested in three different ways:

1. There may be an embryological defect as a result of which the patella develops at the wrong place and is abnormally small.
2. The lower end of the femur may not turn inward sufficiently.
3. The outward pull exerted by the quadriceps tendon may be too strong because of predominance of the vastus lateralis.

Some authors think that all three of the factors mentioned enter into the causation of the condition. Hohlbaum discusses the individual theories in detail. On the basis of a study of the foetus he has come to a conclusion quite different from that of Huebscher and Dreesmann who ascribe dislocation of the patella

to slight inward rotation of the lower end of the femur. Hohlbaum states that when the knee joint is flexed the femur is directed outward and the lower leg inward so that the medial condyle is directed forward and outward and the lateral condyle backward and inward, while the axis of the condyles runs obliquely outward and backward.

This marked rotation in the flexed position of the knee joint, which he observed in a series of cases operated upon, must have an effect also on the ligaments and tendons. The projection of the medial condyle exerts tension on the vastus medialis as well as the internal joint capsule and the ligaments of the medial side. The crucial ligaments also are stretched, while the vastus lateralis contracts and the patella is pulled outward by the quadriceps tendon. Here are all the factors favoring dislocation.

In a study of this rotation in the foetus it was found that when the femur is rotated in one direction the bones of the leg are rotated in the opposite direction. Even when the ligaments are cut this remains true, a fact which would seem to indicate that the form of the joint rather than the action of the ligaments is responsible. The form of the human joint is congenital for in foetal life up to a certain period there is no muscle action upon it.

The author describes this rotation and the part played in it by certain muscles of the upper and the lower part of the leg, and points out that when there is rotation in one direction of the femur there must necessarily be rotation in the opposite direction of the bones below the knee. This had been previously observed and described by Fischer. The antagonism is a factor in the development of the whole extremity.

In the further course of his report the author discusses theoretically the origin of the X- and O-leg in arthritis deformans and other deformities of the extremities and the joints. It is impossible to abstract the article briefly as a complete understanding of its details can be obtained only by reading it in its entirety.

VORSCHUETZ (Z).

Von der Huetten, F.: The Treatment of Fractures of the Patella (Zur Behandlung der Kniescheibenbrueche). *Beitr. z. klin. Chir.*, 1921, cxxi, 687.

Riedel states that the treatment of fractures of the patella will remain a debated question until a method has been devised by which solid healing of the fragments can be obtained without risk. The author adds that ideal treatment includes also the restoration of function.

Anatomical studies have shown that the patella is to be regarded as a sesamoid bone inserted in the quadriceps tendon, that the middle fibers of the extensor muscle which pass over the patella and into the ligamentum patellae are only a part of the anterior musculature of the thigh, and that if their function is destroyed it can be compensated for by the lateral ligaments. Therefore the power of extension is abolished only when the lateral ligaments are injured in addition. Von der Huetten agrees with Schulze in dividing fractures of the patella into those

of the patella alone and those in which the patellar fracture is associated with rupture of the collateral ligaments.

There are three methods of treatment: (1) conservative treatment; (2) subcutaneous or percutaneous suture; (3) open suture. The first is indicated only in the rather unusual fractures due to direct violence in which the power of extension is not destroyed and there can never be separation of the fragments. If there is dislocation of the fragments and more or less injury of the collateral ligaments, operative treatment is indicated as otherwise there is apt to be failure of union of the fragments on account of contraction of the extensor muscle, effusion of blood, and interposition of soft parts. Moreover, re-fracture is often necessary after conservative treatment on account of connective-tissue union of the fragments.

A study of the anatomical conditions shows that subcutaneous and percutaneous methods are not indicated. Of the open methods of operation the author prefers peri- and prepatellar suture, this preference being based on fifteen years' experience. Suture of the bone alone without suture of the collateral ligaments is not sufficient, but following bone suture combined with suture of the collateral ligaments there are apt to be disturbances due to the wire sutures. These, of course, do not occur following simple peri- and prepatellar suture and the latter is quite sufficient.

In cases of compound fracture the author waits for cicatrization of the external wound and then does a secondary suture. He advises against plastic operations, especially in simple fractures. Most of the patellar fractures in men are transverse fractures due to direct violence. Of 31 fractures 24 were transverse and 27 were caused by direct violence.

Among the cases treated by the three operative methods mentioned the best results were obtained in those in which peri- and prepatellar suture was done. Active and passive movements should be begun two weeks after operation. After three weeks the patient gets up, and in the third or fourth week mechanical treatment is begun. In the cases of patients who have a claim for damages the author advises especially careful after-treatment and observation as such patients cannot be counted upon to give very active voluntary help in measures to restore their ability to work.

HOHMEIER (Z).

Ferron, J.: A Case of Old Fracture of the Ankle with Vicious Consolidation; Treatment by Resection of Both Malleoli and Astragalectomy (Note sur un cas de fracture ancienne du cou-de-pied vicieusement consolidée; double ostéotomie et astragalectomie). *Rev. d'orthop.*, 1921, xxviii, 119.

The author describes a case of fracture of the ankle which occurred Nov. 7, 1916, and which he operated upon Feb. 26, 1918. He gives illustrations and radiographs of the foot before and after operation. There was pronounced valgus and equinus.

The foot extended in almost a straight line from the leg. The toes were flexed like a claw. The internal malleolus was as large as a hen's egg.

Roentgen examination showed fracture of both malleoli with displacement of the fragments. The astragalus was pushed upward between the tibia and the fibula so that there was considerable space between these bones, and the fibula seemed to have been driven downward into the body of the astragalus. There was newly formed bone in the space between the tibia and fibula and an extreme degree of displacement of the astragalus. The patient was unable to walk as there was no point of support for the weight of the body.

Ferron describes his resection of the two malleoli and the astragalus in detail. Following this procedure he was able to correct the position of the foot. He then immobilized the foot in a position of flexion and slight varus. The toes were extended to a normal position. A drain was left in for forty-eight hours. At the end of ninety days the patient was able to walk with canes with the foot in a normal position.

A. G. MORGAN, M.D.

Thomas, T. T.: A Method of Applying Extension with Plaster-Cast Fixation in Fractures of the Leg. *Surg. Clin. N. Am.*, 1921, i, 207.

Thomas' experience is based on the treatment of fractures extending over many years, and the method he describes is one which has given him by far the most satisfactory results in conservative treatment. In fractures of the femur with overlapping the ordinary Buck's extension has little or no correcting influence, while in overlapping fractures of the leg the fracture box has no effect at all. The author has also discarded the Hawley table as an instrument of reduction. The Thomas splint depends primarily on the Buck adhesive plaster method to regulate the traction. The ice-tong traction allows a more direct pull on the lower fragment.

In the method the author proposes the traction is applied to the foot by means of a plaster cast. Pressure sores are prevented by heavy padding and by cutting away portions of the cast over the points of pressure. Essential and peculiar to the method is the use of an ordinary wooden splint and a metal piece which serves as a lever and fulcrum for the application of traction. For leg fractures the splint should be about 4 in. wide, 1 in. thick, and long enough to extend from 2 to 3 in. above the knee to about 18 in. below the foot. The excess of 18 in. below is to allow for the effect of the extension on the fracture during the application. When the necessary extension has been obtained the excess length is sawed off.

The iron plate is the chief factor in the method. It is first applied to the plantar surface of the foot by means of plaster of Paris, care being taken to separate it from the foot by a sufficient amount of cotton. The purpose of the plate is to fix the leg in extension and, if necessary, to increase the extension during the application of that part of the cast

which is to maintain the traction afterward and immobilize the fracture. It should be 2 in. wide, 12 in. long, and $\frac{1}{4}$ in. thick. Its lower end is extended into a point which catches firmly into the wooden splint and acts as a fulcrum to maintain the traction while the fixing portion of the cast is being applied. After the metal plate is in place the wooden splint is padded and fixed to the limb by means of a flannel bandage. Plaster of Paris is then applied from a point 5 or 6 in. above the upper end of the splint to just below the knee. When the plaster has sufficiently hardened the patient is anesthetized, traction is applied, and the cast is completed. The author discusses in detail the proper method of applying traction. He especially emphasizes what he considers is the best method to complete the plaster cast in order to prevent annoying disturbances at a later period. He makes the necessary openings over the usual pressure points to minimize the pressure pain which the patient experiences when he becomes conscious.

War experience proved perhaps more than anything else the value of extension in fractures of long bones. The author believes that we are still not ready for a standardized method of treatment though he admits that the Thomas method approaches the ideal. He believes that open reduction and direct fixation of the fragments is only temporarily in eclipse and that operative interference has its place and is indicated in certain types of fractures. He cites several cases of operative interference in his own experience and sums up his conclusions as follows:

"My present inclination is to favor this method (the splint and iron plate method) for non-operative correction of fractures of the shaft of the tibia with or without fracture of the fibula, and the Thomas splint and ice-tongs traction for the femur fractures, although I have a strong inclination toward the open method for clean-cut simple fractures in healthy young persons, particularly for fractures of the femur. There has gradually developed in the past two years and a half a confidence in the operative technique and the avoidance of infection not unlike that which most of us feel concerning the danger of infection following operation on a clean case of appendicitis. It may prove later that this feeling of confidence is not justified, but so long as it lasts one is justified in trying to prove that it is justified."

The article is well illustrated with photographs showing the method of applying the traction splint and roentgenograms showing the results obtained.

L. D. PRINCE, M.D.

Painter, C. F.: Infracture of the Second Metatarsal Head. *Boston M. & S. J.*, 1921, clxxxiv, 533.

The author cites the case of a boy 17 years of age who injured his foot while sliding. A first-aid bandage was applied. The acute soreness subsided but discomfort over the second metatarsophalangeal

joint persisted for two months after the injury. Examination revealed slight swelling over the second metatarsal bone near the joint and tenderness over the joint on pressure and manipulation.

The X-ray showed separation of a thin sliver of the cartilage covering the distal articular end of the second metatarsal bone. There was slight capsular thickening. The patient was advised to rest the foot for two weeks. At the end of that time the clinical and X-ray findings were the same. Operation was then performed. A dorsal incision exposing the joint revealed a piece of cartilage united to the metatarsal head by granulation tissue. The cartilage was removed and the end of the bone curetted. Convalescence was uneventful. Four months later the foot was symptomless.

Case 2 was that of a boy of 13 who in November, 1920, complained of persistent pain in the right foot. In an injury of the foot in July, 1920, a sudden sharp pain was felt in the base of the second toe. At that time a diagnosis of fracture was made and the foot placed in a splint for six weeks. There was no relief of symptoms, however, even though the splint had been worn constantly since its application. The X-ray examination confirmed the diagnosis of fracture.

At operation the heads of the metatarsal and adjacent joint were exposed through a dorsal incision. A line of fracture was found to extend part way into the epiphysis and to include the whole cartilage of the joint. The whole fractured portion was removed and the wound closed. In two weeks the patient was able to walk with scarcely any limp and was improving daily.

Case 3 was that of a woman 60 years of age who complained of pain in the second toe when she walked. This had been present since she injured the toe three years previously. Examination showed a hard swelling over the second toe which was tender to pressure and extended over the second metatarsophalangeal joint. The X-ray examination showed both articular surfaces of the joint to be jagged and flared. The space between the bones was greater than normal. The joint was exposed through a dorsal incision. A loose piece of bone the size of a pea was removed and the articular surfaces were flattened. Several bone spicules were removed. Following this operation the patient continued to improve and at the end of a month had very little pain.

F. G. MURPHY, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Wood, D.: The Closure of Septic Bone Cavities Following Gunshot Wounds by Muscle Flaps. *Brit. J. Surg.*, 1921, viii, 460.

The various methods of treating old discharging sinuses leading to cavities in bone are reviewed. The best method is that in which the cavity is filled with a pedunculated muscle flap. This can be done successfully even when the cavity is not absolutely

sterile as the muscle flap is a living plug with a blood supply of its own and therefore has a resistance sufficient to withstand low grades of infection. It also possesses hæmostatic properties which prevent the accumulation of blood clot which would act as a pabulum for infecting organisms. If abscesses are present in the soft tissues they should be drained and treated preliminary to operation on the sinus.

The technique of the procedure is described in detail. Two steps are advised which may be done in a single operation: the enlargement and preparation of the cavity, and the preparation and placing of the flap. There are two types of sinus: those with two openings forming a through-and-through tunnel which must be converted into a funnel-shaped cavity, and those with single openings which must be converted into gutters. The flaps are cut so that the best possible blood and nerve supply is retained. In order that kinking of the pedicle may be avoided they should fall laterally into the cavity. In some cases two flaps may be necessary.

The author reports briefly 24 cases treated by the method described in which there were 3 failures. The average length of time required for healing was forty days: this was also the average time in 14 cases reported by Schultzen. Lefevre reported 53 cases in which there were 8 failures.

The contra-indications to the operation are cellulitis or active inflammation of the muscles around the sinus, excessive wasting of the muscles of the limb, and cases in which the cavity is so situated that there is no muscle available near it.

When cellulitis or active inflammation of the muscles is present around the sinus, preliminary drainage followed by Carrel-Dakin treatment is necessary.

In cases due to gunshot wounds, the wasting is usually localized and due to destruction of the muscle by the missile. In old cases of osteomyelitis in children general wasting of the limb may make it impossible to obtain a sufficiently bulky muscle flap.

The most striking example of cases in which there is no muscle available locally for the formation of a flap are those in which the lower end of the tibia is involved. Here, however, Broca's method of flattening out the cavity can be done on account of the additional support given by the fibula.

G. S. FOULDS, M.D.

Chironi, P.: An Experimental and Histologic Study of the Free Transplantation of Fascia (Contributo sperimentale ed istologico ai liberi trapianti di fascia). *Polichin.*, Roma, 1921, xxviii, sez. chir., 93.

The author discusses the question as to whether transplanted fascia persists and functions in the body to which it is transplanted or is absorbed and replaced by newly formed connective tissue. He quotes the conclusions reached by a number of

authors and states that the diversity of opinion is due in part to the fact that the experiments upon which the theories were based were performed under quite different experimental conditions and with different material.

Chironi performed a series of experiments on rabbits, using the method of vital staining by the injection of carmine with a blue contrast stain. The presence of pyrrol cells staining with blue pyrrol-carmine indicates the vitality of a transplant. He gives the details of his experiments and photomicrographs showing the histologic structure of sections of the transplants after varying periods of time.

In one series of experiments the fascia was transplanted subcutaneously or into the abdominal wall in locations where no functional demands were made upon it. Under such conditions it was found that strips of fascia of moderate size which were transplanted fresh preserved their vitality, but that in those which had been preserved in preserving fluid before transplantation there was partial degeneration with the substitution of newly-formed connective tissue for the original tissue of the transplant. Very small strips of fascia, especially if they had been preserved, underwent almost complete degeneration and substitution by connective tissue. The elastic fibers of the fascia were preserved or even increased in number, but did not invade the neighboring tissue.

In another series of experiments the fascia was transplanted into areas such as the extensor tendons of the leg, in which functional demands were made upon it. From the fourth week there was a change in its structure, the fibers which ran in the direction of the action of force being well preserved while the transverse fibers were replaced by other longitudinal newly formed fibers. Macroscopically the fascia was completely fused with the tendons and recognizable only by a slight increase in the diameter of the tendon at the site of the transplant. Microscopically there was a clearly defined line between the tendon and the fascia, the fascia being alive and active.

Even where transplanted fascia is replaced by connective tissue the practical results are satisfactory as the substituted tissue meets the functional demands made upon it. Transplanted fascia undergoes not only the primary retraction due to its elasticity, but a secondary retraction due to structural changes. This should be taken into consideration in transplanting it into locations where contraction might cause stenosis or produce vicious or deforming over-correction of position.

The article is supplemented with a bibliography of 40 titles.

A. G. MORGAN, M.D.

Christophe, L.: Bone Grafts (Recherches sur les greffes osseuses). *Presse méd.*, Par., 1921, xxix, 204.

Nageotte and Sencert have recently done some experimental work on the grafting of dead tissues, arteries, nerves, and tendons which has suggested

new possibilities in this field. The author has obtained unexpectedly good results in the grafting of bones which were preserved in alcohol until needed for implantation. He removed a piece of rib $2\frac{1}{2}$ cm. long from an adult male rabbit, taking with it the muscle insertions and a piece of the pleura. The portion of pleura was removed because otherwise a remnant of periosteum might have been left behind and the claim might have been made that this was responsible for the regeneration of bone.

In the place of the removed bone Christophe implanted a piece of rib of the same length which he obtained from another rabbit. The second rabbit also was an adult male but of a different race. The graft had been previously boiled in water for twenty minutes and then kept in 94 per cent alcohol. It was attached to the ends of the cut rib on the front end by fine catgut and on the back end by a bronze-aluminum wire, the latter being used so that the graft could be located easily with the roentgen ray when it was to be removed.

The implanted bones were removed after intervals varying from one month to five and a half months. The article includes photomicrographs of the bones after their removal, and the author points out that they resemble those of absolutely normal living bone. It has been objected that the cells which he interprets as normal living bone cells are merely cells which were present in the bone before and had been fixed by the alcohol. To disprove this Christophe shows pictures of sections of a bone which had been implanted in the sacro-lumbar muscles of a control rabbit and does not show these cells.

Christophe concludes that in certain favorable cases dead bone grafts may be revived and become a part of the living organism. This confirms the findings of Nageotte in other tissues. In some of the author's cases there was no regeneration of bone even after five months and a half. This accounts for the fact that not all clinical cases are successful.

A. G. MORGAN, M.D.

Landois, F.: War Injuries of the Large Joints
(Die Kriegsverletzungen der grossen Gelenke).
Ergebn. d. Chir. u. Orthop., 1921, xiii, 502.

This article is based on four years' experience at a field hospital on the western front and a review of the literature up to December, 1919. It is 129 pages in length and divided into a general and a special part. The first part gives statistical data and discusses the different kinds of joint injuries, inflammation of the joints, and the treatment of gunshot injuries of joints in general. In the treatment the author makes a distinction between fresh joint injuries and suppurations of recent or remote date.

At the close of the war many surgeons still advocated the old von Bergmann conservative treatment of gunshot injuries of joints and Landois admits that the advocates of primary operation,

including himself, who have made it a rule to remove every bit of shrapnel immediately in order to prevent infection, have often gone too far. The use of Bier's hyperæmia is discussed in detail; also Thiess' modification, rhythmic hyperæmia.

In the operative treatment, and especially in primary closure of the joint capsule, Landois does not suture the skin over the capsule and fascia, as does Axhausen. He states that he has had poor results from this method. Instead, he uses iodo-form gauze tampons.

Among antiseptic fluids for irrigating joints mention is made of carbolic acid, phenol-camphor, Dakin's solution, and vuzin. The author prefers vuzin.

The fact is emphasized that fresh joint injuries should be carefully watched during the after-treatment. Landois gives in detail the indications in primary, secondary, and late reaction.

In discussing methods of treatment the author advises everyone to adopt the method which he thinks best and to perfect himself in that method. He believes it a mistake for the same surgeon to treat one group of wounded men with hyperæmia, another with irrigation, and another conservatively with simple aseptic dressings and rest. Every method has its own indications and its own technique which must be learned; also its defects. The more methods one man uses in the treatment of the same condition the greater the sources of error and the poorer the results.

The second part of the article treats of six joints, the shoulder, elbow, wrist, hip, knee, and ankle. In each case the anatomy of the joint, the pathology of gunshot injuries of that joint, the clinical picture, the treatment, and the operative technique are discussed.

The author believes that for injuries of the shoulder joint due to rifle bullets and with small entrance and exit wounds the treatment should be as conservative as possible. He recommends a triangular bandage with a Cramer splint. If the joint is opened, however, he states that the soft parts should be carefully trimmed, the joint filled with 3 per cent carbolic acid, and the joint capsule sutured. If a bullet is free in the joint space it should be removed. If there is suppuration of the joint it should be drained, irrigated with 3 per cent carbolic acid, or filled with Chlumsky's solution. In some cases resection is necessary. The methods of operating on the shoulder joint are described.

In wounds of the elbow joint the first symptom is disturbance of function and pain; joint effusion does not occur until several hours after the injury. A roentgen picture is important. In simple rifle wounds conservative treatment is indicated. The arm should be fixed at a right angle on a splint. If the joint is opened the treatment should be the same as that for similar wounds in the shoulder joint. In severe shrapnel injuries immediate resection, partial or total, is necessary. In suppuration, drainage or resection is indicated.

The wrist should be treated as conservatively as possible. Primary resection should be done only if there is fragmentation of several bones and the wound is very much soiled. Empyema of the wrist is especially dangerous as it extends from joint to joint.

Hip-joint conditions present considerable difficulty in the diagnosis. The treatment depends on the extent of the bone injury, the kind of injury, and the degree of infection as well as on the time the patient reaches the surgeon. Uninfected rifle wounds should be given expectant treatment. Extension is recommended. The author has seen only a few cases of opened hip joint. Primary resection is indicated if there is much comminution of bone.

For the knee joint rest in a Volkman splint is recommended when the bullet has simply passed through. In all other injuries it is necessary to operate at once, opening the joint freely with Kocher's lateral hook incision or Payr's median S-incision. A factor essential for uneventful recovery after the removal of projectiles is exact suture of the capsule and the filling of the joint with an antiseptic solution.

In suppuration of joints there are three possible treatments: (1) joint drainage by Payr's method, the joint being filled with carbolic acid; (2) resection, and (3) amputation. In general, the author's results from drainage of the knee joint have been poor. In many cases he has found it necessary to resect or amputate secondarily. He has never been able to produce a movable joint after severe suppurations.

In the knee, amputation should not be deferred too long. If in a case of suppuration of the knee there is doubt whether resection or amputation should be done, it is better to amputate at once as the danger of sepsis is very great. The operative technique is illustrated in detail.

The treatment of injuries of the ankle is similar to that of injuries of the wrist. GLASS (Z).

Cohen, H.: The Willems Treatment of Joint Lesions. *N. York M. J.*, 1921, cxiii, 730.

The author reports sixteen cases of joint lesions which he has treated by active mobilization. One of these was a suppurative arthritis of the knee in which the Willems treatment was carried out with excellent results. Active mobilization was begun immediately after arthrotomy for drainage and the patient was encouraged to walk on the fourth day. Cure was complete in three weeks.

All the other cases were closed joint lesions, fractures, and dislocations. In these, good functional results were obtained in from two to eight weeks by active mobilization begun immediately after reduction.

The conclusion is drawn that the Willems method is applicable to closed lesions as well as open lesions and that it prevents ankylosis.

W. A. CLARK, M.D.

Dickson, J. A.: The Treatment of Stiff Metacarpophalangeal Joints Where There Is No Gross Bony Alteration. *Brit. J. Surg.*, 1921, viii, 272.

After injuries to the hand or forearm, especially those associated with sepsis or nerve injury, the fingers may become stiff in the extended position and greatly impair the function of the hand. In the absence of bony changes, loss of flexion of the fingers seems to be due to fibrosis of the capsule, contraction of the extensor tendons, or involvement of the extensor tendons in scar tissue. Since treatment of this condition by forcible manipulations or the usual gradual correction has been unsatisfactory, the author describes a method which has been used successfully at the Highbury and Uffculme Orthopedic Hospitals.

A plaster cast is applied from a point above the elbow to the finger tips, the wrist being dorsiflexed and the metacarpophalangeal joints flexed as much as possible. The palmar surface of the cast is cut away to the heads of the metacarpal bones and the correction obtained by the use of felt pads. This constant pressure at a right angle to the phalanges brings about full correction in about four weeks. During treatment by baths, massage, and manipulation correction is maintained by a flexion-retaining bar of metal which is well padded and covered with leather and placed on the dorsum of the first phalanx. A wire is run between the third and fourth fingers and joined to a spring at the elbow. Later the spring is attached to a leather cuff above the elbow. Flexion of the interphalangeal joints is attempted only after the metacarpophalangeal joints are fully flexed.

The use of an anæsthetic is not necessary. By the method described the time of treatment is lessened and the number of relapses diminished.

Three cases are reported with photographs taken before and after treatment for six to seven months. Practically full range of movement was obtained.

J. I. MITCHELL, M.D.

Cotton, A.: Reconstructive Surgery of Traumatic Foot and Ankle Deformities. *J. Orthop. Surg.*, 1921, n.s. iii, 196.

Traumatic deformities of the foot and ankle cause disability by interfering with the function of weight-bearing. Therefore any operation which will restore this function will relieve the disability. The author advocates the use of the simpler methods such as osteotomy rather than the more complicated methods.

All such injuries should be studied to determine their effect on weight-bearing and then the simplest means of placing the foot in the position in which it will most securely bear the weight of the body should be chosen. Cotton cites a number of illustrative cases and describes the methods of accomplishing the desired end. The cases include mal-united fractures at the ankle, fractures of the os calcis, paralytic equinovarus, and infection of the bones at the ankle joint. B. H. MOORE, M.D.

Carruthers, F. W.: *The Care and Treatment of Club-Feet.* *J. Arkansas M. Soc.*, 1921, xvii, 206.

The author divides club-foot into the congenital and acquired types and quotes the Albee classification as follows:

Simple forms: talipes equinus, talipes calcaneus, talipes varus, pes cavus, talipes valgus, and pes planus. Complicated forms: talipes equinovarus, talipes calcaneovalgus, talipes equinovalgus, and talipes calcaneovarus.

Whitman states that 77.4 per cent of the cases are of the type known as talipes equinovarus.

In infants the treatment is begun as soon as the deformity is noticed. For the first few weeks manipulations are indicated. Then adhesive straps are applied to supplement the manipulations. In infants over three months old the deformity is over-corrected by plaster casts renewed every three or four weeks. Sometimes tenotomy of the plantar fascia or tendo achillis is necessary.

In cases of long standing more radical treatment is indicated. In addition to the measures mentioned it may be necessary to do a fasciotomy-tenotomy and probably an arthrodesis or remove wedge-shaped pieces.

The author emphasizes the fact that the plaster cast should extend above the knee to the juncture of the middle and upper thirds of the thigh, the knee being flexed at right angles to maintain eversion and over-correction of the foot.

These cases must be kept under observation from three to five years. D. H. LEVINTHAL, M.D.

De Gaetano, L.: *Cuneiform Resection, Plastics, and Tendon Transplantation in Advanced Types of Congenital and Paralytic Club-Foot* (Resezione cuneiforme, plastica e trapianti tendinei nelle forme avanzate di piedi torti congeniti e paralitici). *Chir. d. organi di movimento*, 1921, v, 97.

The author has had many opportunities to study and operate upon cases of club-foot, especially those of the equinovarus variety. His attention has been drawn especially to the advanced types of the deformity occurring most frequently in adults. In such cases cuneiform tarsectomy supplemented by plastics and tendon transplantation gave the best results. Eight cases are reported, in four of which the cuneiform tarsectomy and the supplementary operations were done. Two of the cases were congenital and two paralytic. All showed marked changes in the bones of the foot.

In the author's opinion cuneiform resection should be substituted for the numerous procedures varying from astragalectomy to the destructive operation of Championnière. He uses the fan-shaped scalpel of d'Antona. His antero-posterior incision runs from the vicinity of the malleolus over the most projecting part of the deformity to the tarsals. The soft parts are detached, the tendons being carefully hooked aside, and when the projecting tarsal is sufficiently denuded the cuneiform piece of bone is removed with the scalpel applied obliquely. If

necessary, more than one piece is removed. The superfluous skin is removed at the same time.

For the elongation tenoplasty de Gaetano prefers the Z-method of Bayer with sagittal section as it is least injurious to the blood vessels. In tendon transplantation he grafts the tendon strips of the active muscle into those of the paralyzed muscles (the descending transplant of Vulpius, the active transplant of Hoffa):

The operative treatment must be supplemented by strict postoperative electro-hydro-therapy and attention to the general condition.

W. A. BRENNAN.

Johansson, S.: *Two Cases of Extirpation of the Calcaneus* (Zwei Faelle von Calcaneusextirpation). *Acta chirurg. Scand.*, 1921, liii, 466.

The first case reported was a case of tuberculosis of the calcaneus in a boy 15 years of age. At 3 years of age he had had tubercular spondylitis but recovered. When the tuberculosis of the foot developed it was treated at first conservatively with a plaster cast and heliotherapy but grew worse and a fistula developed on the outer side of the foot. Roentgen examination showed destruction of the whole anterior part of the calcaneus and the formation of a sequestrum. There was pronounced atrophy of the rest of the bones of the foot with the glassy appearance characteristic of tuberculosis. Total extirpation of the calcaneus was followed by uneventful recovery and normal mobility of the ankle joint.

The calcaneus is more frequently affected by tuberculosis than any of the other bones of the foot. It should be treated by early operation in order that extension to the ankle joint may be avoided and a part of the calcaneus may be preserved. Although the posterior process of the calcaneus is one of the three chief supporting points of the foot, in the case described the foot has adapted itself in a remarkable way to the changed conditions and has preserved excellent function. The astragalus has sunk down so that its lower part forms a heel to which the Achilles tendon is attached. The astragalus and the navicular bone have grown together so that in the roentgen picture they appear as a single bone with an outline very much like that of the calcaneus. A new joint has been formed between the anterior end of the astragalus and the cuboid. It is probable that within a year or two the internal structure of this bone will more nearly resemble that of the calcaneus than the astragalus. This case illustrates Wolf's law of transformation according to which changes in the position and function of a bone, and even changes in function alone, bring about changes in the internal architecture of the bone following definite mathematical laws and secondary changes in the external form.

The second case reported was a case of septic osteitis in a 12-year-old boy following a severe bruise of the foot. A subperiosteal resection of the whole calcaneus was done. The infection extended to the ankle joint, causing a septic arthritis. Complete re-

covery resulted with active and passive movements through 25 degrees. Like tuberculosis, sepsis affects the calcaneus more than any other bone of the foot.

Both of these cases illustrate the remarkable capacity of the bones of the young for regeneration and adaptation. It is very important for the patient to use the foot as soon as possible. The foot should be kept in a right-angle position and preferably for a time in a cast.

A. G. MORGAN, M.D.

ORTHOPEDICS IN GENERAL

Lange, F., Schede, F., and Hohmann, G.: Results of Orthopedic Treatment in the War (*Ergebnisse der Kriegsorthopaedie*). *Ergebn. d. Chir. u. Orthop.*, 1921, xiii, 647.

This article, which covers about 150 pages, gives all the essential results of orthopedic treatment during the war in such a condensed form that a brief abstract of it can be little more than an expanded index.

Lange discusses the orthopedic care of the wounded on the field. The necessary fixation in gunshot fracture is obtained best by means of a plaster cast. A table was improvised from gas tubes and straps. If the application of a plaster cast is impossible, splints such as the Lange, the Stubenrauch, and the Rummel splints, which can be applied on the field, are indicated.

The treatment of flat-foot at the right time is important. In one field station during the four years of the war over 12,000 plates were made.

The duties of a field station include the mechanical treatment of slight injuries and sufficient care of severe injuries to make them ready for transportation. It is very important to have surgeons trained in orthopedics, but there was a decided lack of them during the recent war.

Schede discusses treatment in the base hospitals where the proper application of splints and casts is of prime importance and fractures of the femur demand a great deal of attention. To give proper rest it is necessary to immobilize the adjacent joints and it is best to make the cast include both the leg and the pelvis. In fracture of the upper arm a splint is fastened to a plaster girdle around the pelvis. The upper part of the body remains free.

The different forms of fenestrated casts and bridges of plaster are described, their advantages and disadvantages are discussed, and rules for their application are given. If it is necessary to correct the position of the injured parts apparatus such as those of Lange, Boehler, and Ansinn are preferable to plaster casts. All experience goes to show that in fractures of the upper arm only abduction splints should be used. In articular fractures and inflammations the joints must be freed of weight.

The authors discuss the mechanics of development of the foot and the laws of disencumbrance for the foot, leg, and hip. The disencumbrance or support of the spinal column is brought about by extension or lordosis. When a corset is applied early care of

the muscles is important. To prevent joint contractures after injuries of the soft parts and bones, as well as after paralysis, a number of forms of portable apparatus have been devised. There are also apparatus adapted for medico-mechanical treatment. Those of Schede, Engelhard, Lange, and others are described.

The chapter on operative orthopedics was written by Hohmann. In contractures of the soft parts non-operative correction with hæmostasis has given good results, and in some cases cutting of shortened tendons and loosening of adherent tendons has been successful. For contracture of the knee joint in extension, which is very frequent, the methods of Payr, Spitzzy, and Hohmann are recommended. In spastic contractures the methods of Foerster, section of the roots and plastic lengthening of the tendons, have given good results. When plastic lengthening is impossible because there is no tendon, Stoffel's method is used.

Payr and Lexer have devised good methods for the treatment of bony ankyloses of the joints. Moskowicz' arthroplasty in severe joint defects is described with illustrations. The best time for this operation is given differently by different authors. Moskowicz operates during suppuration while Payr and Hohmann delay the operation for as long as a year. A description is given of Goetze's apparatus to supply lacking joints and of the necessary operation for its application. In fractures which have healed with deformity re-fracturing or Kirschner's stair-step osteotomy is necessary with after-treatment in extension. In operations for pseudarthrosis broad contact between the healthy joint surfaces and immovable fixation of the freshened bones to one another or to the transplant are of prime importance.

Nerve sutures as primary operations are not described. Reference is made to the articles on this subject by Spielmeyer and others. For the correction of deformities caused by paralysis Burk's and Mueller's plastic operations on fascia and the tendon transplantation methods of Perthes, Stoffel, Hohmann, Lange, Biesalski, Spitzzy, and others are recommended. Operations to restore grasp in cases in which the fingers and thumb are lost, Spitzzy's method of making a thumb from the rib or index finger, Hoerhammer's transplantation of the great toe, methods of improving the condition of the stump, including Esser's method of covering it with skin, the Schmerz and Oehlecker osteoplastic covering, and the best known methods of utilizing the voluntary movements of muscles for the movement of artificial legs and arms, those of Vanghetti, Sauerbruch, Spitzzy, Walcher, and Kruckenberg, are described.

SPITZY (Z).

Wislocki, G. B.: Experimental Observations on Bone Marrow. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 132.

The experimental study reported in this article was based on the observation that the endothelial

and reticular cells of the bone marrow phagocytose solid particles brought to them by circulating blood.

Wislocki injected into the ear vein of adult and new-born rabbits a suspension of carbon particles in ordinary India ink. Two or three days later the animal was killed.

At autopsy, the characteristic distribution of carbon particles in the body was found to be confined practically to the liver, spleen, lungs, and bone marrow. The bone marrow appeared conspicuously black; the bone marrow granules were observed, for the most part within the cells, in the endothelium of the vessels, and in the cells of the reticulum, although here and there granules were found lying free in the vascular channels.

After fixation the bones were completely decalcified by placing the bodies in 5 per cent nitric acid. They were then cleared by the method described by Spalteholz (1914) by transferring them from absolute alcohol to benzol for forty-eight hours and then into several changes of oil of wintergreen and one part of benzyl benzoate, in which they were finally kept permanently.

In the adult skeleton carbon was abundantly present in the cervical, thoracic, lumbar, sacral, and caudal vertebrae, heavily and uniformly present throughout the ribs, in the skull in both membrane and cartilage bones which are in whole or in part cancellous, in the cancellous regions of the scapula, and in the humerus, radius, and ulna.

The carpal and metacarpal bones and the phalanges of the digits contained only traces of carbon. The same was true of the tarsal and metatarsal bones and phalanges.

In a rabbit three weeks old the heaviest pigmentation occurred in the long bones of the extremities. The carpal, metacarpal, tarsal, and metatarsal bones, and the phalanges were deeply pigmented.

In a rabbit one week old carbon particles were abundantly phagocytosed and stored in those bones in which ossification had begun and in the separate ossification centers.

Microscopical examination showed clusters of blood-forming cells scattered fairly uniformly throughout the cancellous portions and shafts of all the bones. The distribution of carbon particles was found to coincide closely with that of the hæmatopoietic tissue.

From these observations it will be seen that the bone marrow of the rabbit contains cells which are extremely phagocytic toward inert particles afloat in the blood stream. Some of these are endothelial cells which line the vascular channels of the marrow; others are reticulum cells which form the supporting tissue for the blood-forming elements of the marrow. This phagocytic power is present at birth. Microscopic examination shows that the distribution of these phagocytic cells in the bones coincides closely with that of the blood-forming elements. The cleared tissues of rabbits injected during life with carbon particles give us an accurate picture of the gross distribution of the marrow. The amount of

marrow in flat bones is in direct proportion to the amount of cancellous or spongy structure in the bone.

Several dogs, cats, and guinea-pigs were similarly injected with suspensions of carbon. In the dog and cat, carbon was not grossly visible in the marrow, and only an occasional carbon particle was discovered in the endothelial cells. In the guinea-pig, the marrow appeared blackened, but not to the same extent as in the rabbit. Microscopically the marrow showed fewer and less carbon-laden phagocytic cells.

There is, therefore, a difference in the ability of the bone-marrow cells in different mammalia to phagocytose and store particles of carbon.

MORRIS H. KAHN, M.D.

Fairbank, H. A. T.: A Clinical Lecture on the Orthopedic Treatment of Poliomyelitis. *Brit. M. J.*, 1921, i, 517.

The treatment of infantile paralysis is usually divided into three stages. During the acute stage of the disease the important factor is rest for the spinal cord and the affected muscles. The author advises rest in bed for at least three weeks. Stretching of the paralyzed muscles and contraction of their opponents must be prevented. If necessary, splints or plaster casts should be used for this purpose. Deformity is caused by improper muscle action and gravity. Early deformity can be easily corrected by stretching the contracted muscles. Massage is harmful as long as there is tenderness.

The second stage of the condition may last as long as two years, during which time muscle power gradually returns. The limbs should be kept warm and massaged regularly. Muscle re-education is of great value. Electrical stimulation may be beneficial but is not as good to increase the power as voluntary muscular contraction. To secure the best results the load must be proportional to the strength of the muscle. When the muscle is very weak, gravity must be eliminated. Care must be taken not to cause fatigue or damage by heavy manipulations. Between periods of exercise the muscles should be relaxed by the use of splints and braces. Night splints are just as important as the walking apparatus. Operative measures should be limited to tenotomies, fasciotomies, and manipulations for the correction of deformities.

In the third stage the treatment should be directed toward utilizing the muscle power of the paralyzed limb to its best advantage. Tendon transplantations should not be done under two years from the time of onset of the condition. The deformity must first be corrected. Only muscles with a fair degree of power should be used. These can be attached subperiosteally or the tendon may be passed through a hole drilled into the bone. Flexors cannot be transferred and made to act successfully as extensors. When the biceps femoris is attached to the patella the knee may be made more stable, but the author has never seen such a case with

voluntary extension of the knee. The tibialis anticus may be swung to the outer border of the foot with excellent results, and the transference of the tendon of the extensor hallucis to the first metatarsal successfully prevents drop-foot. In this latter operation it is well to suture the distal portion of the tendon to a slip of the extensor brevis in order to prevent flexion of the distal phalanx of the great toe. Tendon transplantation in the upper arm is less common but may be done with good results.

An important item is the exactly correct amount of tension under which the muscle is sutured. Arthrodesis is done at the shoulder when the scapula muscles are active and the function of the forearm and hand justifies the procedure. The elbow may be fixed in the flexed position by removing a diamond-shaped piece of skin on the anterior surface and suturing the wound transversely. Arthrodesis of the hip is rarely justifiable. The knee is seldom ankylosed unless the patient objects to wearing apparatus. Excellent results are secured in some cases of arthrodesis at the ankle when the subastragalar or the mid-tarsal joints are also stiffened. The Whitman astragalectomy is recommended for almost all flail ankles. The use of silk ligatures and tendon fixations has not been successful in the author's experience.

Scoliosis is a serious result of paralysis of the spina or abdominal muscles. It may appear early in the disease and care should always be taken to prevent it if possible. Jackets of plaster and celluloid are of some value and in selected cases the spinal graft of Albee is advisable.

J. I. MITCHELL, M.D.

Corner, E. M.: Light Metal Limbs in Above-Knee Amputations. *Brit. M. J.*, 1921, i, 524.

In cases of above-knee amputations at St. Thomas' Hospital the best functional results were obtained when the stumps were of medium length. The ilio-psoas and the glutei, the chief muscles activating the stump, are given the best leverage in a stump 8 or 9 in. long. Mental deterioration was prevented by a minimum of hospital life and a rapid return to work and cheerful surroundings.

It was found that light metal artificial limbs were excellent as the men learned to use them more quickly than wooden limbs, were able to get about with them with greater comfort and speed, and were not so easily fatigued. Metal limbs require repair less frequently than the other types. The author concludes that from 90 to 95 per cent of the men with above-knee amputations were greatly benefited by the use of metal limbs.

J. I. MITCHELL, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Altschul, W.: Anterior Spina Bifida and Other Malformations of the Spinal Column (Spina bifida anterior und andere Missbildungen der Wirbelsäule). *Fortschr. a. d. Geb. d. Roentgenstrahlen*, 1921, xxvii, 607.

In the course of a systematic roentgen examination of the spinal column of bed-wetting children, in whom Fuchs noted the syndrome of myelodysplasia, a condition in which posterior spina bifida occulta is frequently found, Altschul discovered a number of unusual malformations of the spinal column due to fissures in the bodies of the vertebræ. A few cases of such changes have been described. Most of them come under the classification of anterior sacral hydromeningocele. In some of the cases studied by Altschul there was no true fissure but the body of the vertebra was only half developed. In others, a fissure was found, not in the midline, but on one side, constituting an anterior lateral spina bifida. The beginning of such morphological anomalies must go back to the blastemic period, or at least to the beginning of the chondrogenous period, for only at this time are the bodies of the vertebræ symmetrically bilateral.

A further observation reported was the discovery of a supernumerary rudiment of a vertebra between the fourth and fifth lumbar vertebræ. In another case, that of a child 20 months old who came for treatment for congenital scoliosis, a roentgenograph showed a wedge-shaped half of a vertebra with a rib attached to it between the seventh cervical and the

first dorsal vertebræ. In addition, the eighth dorsal vertebra was rudimentary, being wedge-shaped and having a rib on only one side. On the left side, therefore, there were thirteen fully developed ribs and on the right side only eleven.

The literature and the theories as to the causes of such unusual malformations are discussed in detail.

HARMS (Z).

Radulesco, A. D.: The Use of a Piece of Rib as a Splint in the Treatment of Pott's Disease (La synostose vertébrale par greffon costal comme traitement orthopédique opératoire du mal de Pott). *Presse méd.*, Par., 1921, xxix, 284.

The author advocates operation in old cases of Pott's disease with pronounced spinal symptoms which have resisted orthopedic treatment. He describes the technique of a method which he has employed successfully in seven such cases. He induces spinal anæsthesia with stovaine-caffeine or stovaine-strychnine. The patient lies on his abdomen supported on pillows. A median incision is made extending a few centimeters above and below the affected vertebræ. As a rule this is between 15 and 20 cm. long. The muscles are pulled away from the spinous processes, the intraspinal ligaments are cut, and the processes are split in half, care being taken to divide them into exactly equal parts. For this purpose a circular saw is used.

The halves are then pulled apart and broken downward so that a bed of bone with the marrow is

exposed. The wound is covered with sterile compresses while a section just long enough to fit into this bed is being removed from one of the patient's ribs. The rib also is sawed in two, the upper half being removed and the lower half being left in place. The section of rib is then placed in the bed prepared for it so that the marrow of the rib and that of the vertebræ are in contact. It is not necessary to suture the rib in place. The aponeurosis and muscles are merely sutured over it.

The patient is kept lying on his abdomen for eighteen days, and in bed for a month. In four cases the author applied a plaster corset after the operation, but these were cases in which so many vertebræ were involved in the tuberculous process that it was necessary to use two pieces of rib for the splint. The corsets were removed after a month.

The spinal symptoms were very much improved in every instance. One patient was not able to stand six months after the operation, but this was a very advanced case as paraplegia with loss of control of the sphincters and trophic disturbances had been present for more than a year. However, sensation has returned in the lower limbs, the sphincters are almost normal, and the patient's movements in bed show normal co-ordination. A. G. MORGAN, M.D.

Cassirer, R., and Krause, F.: Early Diagnosis of a Tumor of the Cervical Cord; Operation; Recovery (Frühdiagnose einer Halsmarkgeschwulst, Operation, Heilung). *Berl. klin. Wchnschr.*, 1921, lviii, 224.

A 35-year-old woman had suffered for four years from severe pain which radiated from the neck into

the right arm and sometimes also into the left arm. This pain was increased by coughing, sneezing, and sudden movement of the body. At times complaint was made of formication on the inner side of the right arm and hand and a feeling of weakness in the right leg.

Examination revealed sensitiveness on percussion of the seventh cervical and first dorsal spinous processes. The right abdominal reflex was permanently weaker than the left. Stroking of the outer side of the right foot caused dorsal flexion of the great toe. Deep and superficial sensation in the ulnar region of the right arm was slightly disturbed.

Operation showed a tumor 24 mm. long, 14 mm. broad, and 7 mm. thick originating in the arachnoid on the right anterior side of the cervical cord and extending forward to the midline and downward from the fifth cervical segment. When the sixth and seventh cervical arches were removed and the cervical cord was lifted up by the sixth posterior root the neoplasm could not be seen. As it was impossible to pass a sound upward, the fourth and fifth cervical arches were removed, the fifth and sixth posterior cervical roots were cut, and the cord was lifted up and pulled aside by the root stumps. The tumor was then easily enucleated. Recovery resulted.

The case reported is noteworthy because of the early diagnosis from the few symptoms and the location of the tumor on the anterior side of the cervical cord. The findings in the cerebrospinal fluid and the histologic structure of the tumor are not given.

WREDE (Z).

SURGERY OF THE NERVOUS SYSTEM

Thorburn, W.: The Surgical Treatment of Neuralgia. *Practitioner*, 1921, cvi, 305.

The author emphasizes particularly the importance of accurate diagnosis. His classification of the various types of neuralgia which, he states, "is practical and convenient" rather than "purely logical," is as follows:

1. Neuralgias due to general conditions. These are probably toxic in nature, often affect more than one nerve trunk, and do not call for surgical treatment.

2. Neuralgias due to pressure. Sciatica may be due to lipomata of the thigh, tumors in the pelvis, or disease or tumors of the spinal column. Bilateral sciatica should suggest pelvic pressure. A history of continued pain followed by symptoms of a transverse lesion of the cord is one of the most definite indications of intrathecal tumors. This is important because these tumors are easily removed and their removal is followed by good results. In neuralgia of the upper extremities the presence of a cervical rib should be borne in mind. Neuralgia due to pressure includes neuralgia due to cicatrices, especially of the scalp. These are cured by excision.

3. Neuralgias associated with tabes dorsalis. The lightning pains rarely demand operation. In the treatment suggestion is an important factor. Gastric crises can be cured by the Foerster operation. When the symptoms are unilateral this operation should be performed on only one side.

4. Neuralgia due to intraneural lesions. Intraneural lesions vary from simple hæmorrhage following trauma to tumor or fixation of a nerve by adhesions. The author objects to the blind methods of treatment such as acupuncture, stretching, and injection with salt solution. He prefers exposure of the nerves and careful inspection for definite surgical lesions. When no lesion is found he resorts to injection of 1 or 2 c.cm. of 60 per cent alcohol into the nerve sheath. The disadvantage of this treatment is that motor nerves may become paralyzed. When a nerve lesion is close to the spinal cord rhizotomy is the operation of choice.

5. Ganglionic neuralgia. This group includes trigeminal and post-herpetic neuralgias. These are treated by alcohol injection (Schlosser's method). When more than two injections fail to give relief gasserectomy (Hutchinson's method) is the author's

operation of choice. Thorburn has had no experience with either Frazier's or Adson's operation but expresses the opinion that proficiency in one method is better than alternating techniques.

J. J. LEBOWITZ, M.D.

Oehlecker, F.: Extirpation of the Second Spinal Ganglion in Occipital Neuralgia (Erfahrungen ueber die Exstirpation des II. Spinalganglion bei der Occipitalneuralgie). *Deutsche Ztschr. f. Nervenh.*, 1921, lxi, 296.

Oehlecker removed the ganglion of the second cervical nerve in a case of occipital neuralgia for the first time in May, 1913. Since then he has performed this operation in ten cases. One of the patients died from meningitis due to infection of the wound from a neighboring granulating surface. In the nine other cases the extirpation was followed by excellent permanent results.

Oehlecker believes that when operation is necessary for the relief of occipital neuralgia the ganglion should be removed at once because if there is recurrence after any other operation its removal is made much more difficult by the presence of scar tissue. Even primary extirpation of the ganglion is an operation of considerable severity. KAPPIS (Z).

Volkman, J.: The Treatment of Chronic Ulcers of the Leg by Stretching the Nerve (Die Behandlung chronischer Unterschenkelgeschwure mit Nervendehnung). *Zentralbl. f. Chir.*, 1921, xlviii, 193.

In stubborn cases which had resisted various methods of treatment, some of them very old cases, Volkman tried nerve stretching, a method recommended twenty-five years ago, first for perforating ulcer of the foot, and then for ulcer of the leg. Of 12 cases, 9 were cured and 1 was benefited. Volkman admits, however, that the patients have all been under observation for only a short time.

The skin nerves of the region involved were stretched moderately under local anæsthesia. The saphenous nerve, which was most frequently involved, was found by making an incision from the top of the tuberosity of the tibia along the middle of the inner surface of the tibia, 5 cm. inward and backward. It was always discovered beneath the saphenous vein, and as a rule immediately under the fascia in the fatty tissue. The other nerves, the chief branches of the peroneal nerve, were located in the popliteal space on the external side of the main nerve. The treatment should not be given too near the ulcer.

The after-treatment consists of rest in bed and the application of dressings of boric acid zinc salve. The rapid healing of the ulcers shows that they are caused both by mechanical and nervous conditions transmitted by the sympathetic but controlled by cerebrospinal influences. GRASHEY (Z).

Renton, J. M.: The Surgical Treatment of Chronic Sciatica. *Brit. M. J.*, 1921, i, 557.

Surgery is indicated for the cure of certain cases of sciatica which have failed to respond to medical

treatment. In the selection of cases care must be exercised to exclude disease of the hip joint, tumors or inflammatory conditions in the pelvis, exostosis, and nervous conditions, both organic and functional, any of which may simulate sciatica.

When the patient is quite free from pain while at rest but begins to have pain on exercising or assuming some special position, the condition is favorable for operation as the pathology consists of the presence of post-inflammatory adhesions about the nerve.

A second type of case is that in which a certain amount of pain is present while the patient is at rest and it becomes intense during exercise or the assumption of special postures. These cases also may be operated on with success.

When the pain is indefinite and intermittent during rest and sometimes improves to a certain extent during exercise, it is probably due to neuritis with adhesions about the nerve. This third type of case is unfavorable for exploration.

Surgical treatment consists in freeing the sciatic nerve from adhesions. The nerve is exposed below the gluteus maximus muscle by a 4 or 5 in. longitudinal incision. It is then hooked up and the adhesions are carefully removed from the sacro-sciatic notch to about the middle of the thigh. Care must be taken to preserve the branches to the hamstring muscles which come off just below the lower border of the gluteus maximus. When freed, the nerve is dropped back into the wound and the skin sutured.

The essential feature of this operation is the removal of the adhesions.

Crawford Renton cured 32 patients by this method. The author operated on 10 cases and effected a cure in 8. One of the cases which were not cured belonged to the second type mentioned, and the other to Type 3. A. C. JOHNSON, M.D.

Platt, H.: The General Indications for Operative Exploration in Nerve Injuries. *Lancet*, 1921, cc, 789.

An exploratory nerve operation is justified under the following conditions: (1) when the syndrome of complete nerve interruption has continued unchanged over a period of six months of clinical observation; (2) when the syndrome of incomplete interruption has continued with changes for six months, and especially when this is shown by the distal syndrome, and (3) in the presence of the syndrome of irritation of moderate or severe degree which shows no signs of subsidence.

The nerves are exposed in an intermuscular interval and their physiological activity is determined by direct stimulation with the faradic current. One of the most obvious practical advantages of this method is the ease with which nerve trunks are recognized in regions such as the upper arm and axilla when ordinary anatomical landmarks are lost in the scarred and destroyed tissues. Motor branches arising from the nerve trunks above the

lesion are readily identified and examined with regard to their physiological integrity. However, it is only in dealing with incomplete anatomical lesions that the presence or absence of the electrical response is of practical value.

The operative procedures of choice for the repair of defects of the nerve trunk consist chiefly of complete suture, resection and end-to-end suture, and the conservative manœuvres of neurolysis and partial resection. Resection is indicated when the extent and nature of the lesion prohibit a sufficient down-growth of regenerating fibers to insure adequate motor and sensory function.

Neurolysis is performed practically every time a nerve exploration is undertaken since an endeavor is made to provide a normal bed for the freed nerve trunk. For the restoration of conductivity this operation is impracticable as it deals with extraneous lesions; therefore, it should be replaced by resection and suture.

The indications for partial resection, aside from technical objections, cannot be defined clearly except in theory and the procedure should be abandoned as a standard method of nerve repair.

Success with end-to-end suture is often materially influenced by: (1) the degree to which the nerve can be mobilized by extensive anatomical exposure, (2) the stripping or even the sacrifice of muscular branches, (3) such displacement of the nerve as will shorten its course, and (4) the relaxation obtained by a change in the posture of the limb. In case of failure of end-to-end suture at the first exploration it is legitimate to re-explore after an interval and attempt repair in two stages. The author believes that success is attained by wide exposure of the nerve and not by so-called stretching of the nerve trunk. The latter does not diminish the gap.

Bone shortening to facilitate end-to-end approximation is justifiable only in case of an ununited fracture of the humerus accompanying a musculo-spiral nerve injury where the shortening of the bone is necessary preliminary to exploration and suture of the nerve.

The nerve graft has long been employed in peripheral nerve surgery. It is an acknowledged fact that axis cylinders can cross a gap and may utilize the channels afforded by the graft. A considerable number of motor and sensory fibers, however, must secure passage through the graft if the result is to be even partially successful. Until this step is accomplished the operation must be condemned on practical rather than physiological grounds. The surgeon must not relax his efforts to secure end-to-end union, however tedious the operation.

The author's conclusions and deductions are based on a series of 248 operations including 150 end-to-end sutures, 80 neurolyses, and 18 bridge operations. All of the bridge operations were complete failures.

Suture operations performed within a period of eighteen months show little difference in the time of the onset of recovery or its rate and ultimate completeness.

Recrudescence of infection after suture occurred in a number of cases and caused delay or cessation of recovery.

The distance of the line of suture from the spinal centers or, conversely, from the distal extremity of the limb, is an important factor in the prognosis of the regenerative process. Recovery in the proximal muscles begins at an early or late date according to the proximity of the sutures to the spinal cord and occurs in regularly descending fashion in accordance with the anatomical origin and distribution of the motor branches. The author and Stracker have found that recovery does not occur before one year following suture in the distal muscles supplied by the musculospiral, median, or ulnar nerves, this being irrespective of the level of suture. Therefore the time taken for neurotization of the distal muscles is not entirely dependent on the distance which down-growing axons have to travel.

It does not appear that the perineural surroundings influence recovery after nerve suture except when the nerve trunk has been subjected to the friction of a bony groove.

Continuance of active interstitial neuritis in the proximal nerve is a cause of delay or failure which may be avoided by free resection before suture is attempted.

The results of the 80 neurolyses included partial and complete recoveries and complete failures. In 75 per cent of the cases showing improvement it has been impossible to prove that the operation alone was responsible. The limitations of the operation as a definite factor in the surgical treatment of lesions of nerves due to warfare should be fully realized.

A. C. JOHNSON, M.D.

Thorburn, W.: Remarks on Posterior Rhizotomy for the Relief of Pain. *Brit. M. J.*, 1921, ii, 629.

The author briefly reviews the literature on posterior rhizotomy for the relief of pain. The first recorded case was that reported by Bennett who divided the posterior lumbosacral roots for sciatica. Hhrsley, Chipault, Abbé, and others have performed this operation. In the earlier scattered cases the results were doubtful, but in some a persistent neuralgia was completely cured. The publication of Foerster's work in 1914 brought the subject into prominence. Foerster adopted rhizotomy principally in the following conditions: (1) spastic symptoms of the lower limb, (2) gastric crises of locomotor ataxia, and (3) various types of pain. The author discusses the last two conditions as he does not consider operation for the spastic symptoms of the lower limb very satisfactory.

Gastric crises are divided into two groups: (1) the vagal, in which there is marked nausea with little pain or hyperæsthesia, and (2) the sympathetic, in which pain and hyperæsthesia are common, but nausea is not very prominent. Rhizotomy is recommended principally for the latter type, and bilateral resection of the fifth to the twelfth dorsal roots is done. The histories of two patients with

gastric crises who were operated on in 1914 are reported. After a six-year interval one of these showed complete immunity and the other marked improvement.

Attention is called to the postoperative completeness and permanence of the anæsthesia and the total absence of trophic changes in the affected parts. In these respects the results of the operation conform to those produced by dividing the sensory roots of the gasserian ganglion.

Two cases are reported in which rhizotomy was done for brachial neuritis following severe trauma. The results were not good and at operation there was evidence that the inflammatory process had

extended to the central nervous system. In the published records the best results were obtained when the neuralgia was limited. The comparative success of the limited operation must be due to some other factor not fully explained.

The dangers of the operation in experienced hands are much less than it would appear from the published results. Surgeons experienced in laminectomy agree that the operation is not more dangerous than laparotomy. Even if the results with regard to the cure of pain are still somewhat uncertain, it is unquestionably well worth while to give the patient the prospect of cure or relief offered by posterior rhizotomy. MERLE R. HOON, M.D.

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Rosenfeld, A. S.: Idiopathic Purpura with Unusual Features. *Arch. Int. Med.*, 1921, xxvii, 465.

Rosenfeld describes two cases of idiopathic purpura which showed a familial tendency, the patients being brothers. Repeated joint hæmorrhages with symptoms of Henoch's purpura were present in both. In one case spontaneous fracture occurred.

Such familial cases of purpura seem to indicate that the condition is a definite entity. It would seem that in certain families there is an inherent weakness of the germ plasm which manifests itself either in a deficiency of blood platelet formation or primary vascular degeneration, or both.

MORRIS H. KAHN, M.D.

Miller, R.: A Fatal Case of Celiac Infantilism, with Comments on the Morbid Anatomy of Celiac Disease. *Lancet*, 1921, cc, 743.

The patient, a child 2 years of age, had a normal birth, and nothing abnormal was noticed until he was weaned. At this time feeding difficulties began with a tendency to looseness of the bowels. The mother stated that for six months he had had severe diarrhoea which caused wasting. The stools were pale and offensive and the abdomen was large. There was periodic swelling of the hands, feet, and eyelids. A provisional diagnosis of abdominal tuberculosis was made. The patient was discharged slightly relieved.

Nine months later he was seen again at the dispensary. The diarrhoea and œdema had been worse and the child had not grown for six months. Bismuth and opium checked the diarrhoea.

Nine months later the patient was again registered as an out-patient and under treatment was fairly well for six months.

When 4½ years of age he was again admitted to the hospital. The abdomen was large but showed no tuberculosis. The stools were typical of celiac disease. In the hospital the diarrhoea lessened, but there was no gain in weight or height.

One year later the patient was seen once more. He was markedly under normal weight and development. His stature was that of a child between 2 and 3 years of age but his facial expression was nearer that of his own age. His teeth had been extracted for caries. There was no evidence of rickets. The abdomen was large but no masses were present. The bowel movements were the same as before.

On a special diet low in fat the diarrhoea lessened, but the patient continued to lose weight. For three weeks he then seemed to be improving but at the end of this period he had a sudden attack of fever and severe diarrhoea with blood and mucus which was followed in eighteen hours by collapse and death attributed to influenza.

The noteworthy findings at autopsy were copious deposits of fat in the omentum, hæmorrhagic changes in the adrenals, and injection of the mucosa of the colon without ulceration. There was no evidence of tuberculosis or chronic inflammation of the intestinal tract.

This case shows that celiac disease sufficiently persistent to produce infantilism and associated with œdema of the "alimentary" type may exist apart from structural changes in the pancreas, liver, and intestine. The excessive fat wastage is independent upon morbid changes in these organs. The lack of growth may be due to a secondary enteritis. The enlarged abdomen of celiac disease is due to the excessive fat deposits in the omentum and abdominal wall.

Postmortem records of three other cases were found in the literature. Close consideration of these failed to prove that the excessive fat loss in the stools is due to an enteritis. If this view is correct, it follows that the defective fat absorption in celiac disease must be due to a fault in digestive secretion, probably in the bile. MERLE R. HOON, M.D.

Chagas, C. P.: A Case of Carcinoma of the Matrix of the Nail (Carcinoma da matriz da unha). *Brazil-med.*, 1921, xxxv, 233.

The patient was a man of 60 who had had bubo at the age of 18 and gonorrhœa later. Subsequently

he suffered from rheumatism of the right knee which was cured by potassium iodide treatment. About twenty years before he was seen by the author he sustained an injury of the second toe and the great toe of the right foot. About eighteen months previously he noticed a thickening of the nail on the right great toe which was painful when he put on his shoes. The nail continued to increase in thickness and finally split in different directions until it became a large, horny mass occupying the bed of the nail. In the center of this mass was a small denuded and ulcerating area.

Microscopic examination of the excised growth showed it to be a carcinoma of the matrix of the nail. Two illustrations show its histologic structure. In Heller's "Diseases of the Nails," published in Berlin in 1900 only three similar cases are described. The author's case has not been under observation long enough to warrant the assumption that the danger of recurrence has passed.

A. G. MORGAN, M.D.

SERA, VACCINES, AND FERMENTS

Sordelli, A.: The Presence of Normal Antibodies in the Blood (La presencia de anticuerpos normales en la sangre). *Rev. Asoc. méd. argent.*, 1920, xxxiii, 108.

The presence of normal antibodies in the blood may be due to: (1) the passage of antibodies from the maternal blood during uterine life; (2) the assimilation of antibodies during lactation; (3) the parenteral introduction of bacteria, antigens, proteins, products of autolysis, or secretions; (4) their spontaneous appearance as an organic reaction without any apparent cause. The fourth type is completely distinct from what is known as artificial or acquired immunity, and its differentiation from the other types is very difficult, if not impossible.

The author has determined the quantity of antitoxin in the circulation in a large number of patients. In these investigations his most important finding was that the content of normal antibodies increases with the age of the subject.

W. A. BRENNAN.

Cheinisse, L.: Autoserotherapy and Autohæmotherapy in Skin Diseases (L'autosérothérapie et l'auto-hémothérapie dans les dermatoses). *Presse méd.*, Par., 1921, xxix, 345.

In 1911 Mayer and Linser treated herpes in a pregnant woman with injections of blood serum from a healthy pregnant woman. This treatment was based on the theory that normal pregnancy provides antitoxins for the toxins developed during that condition and on the assumption that the serum from a normal pregnant woman would supply the deficient antitoxins in the patient's blood. While the results were good, the theory was poor for it was soon found that normal serum from any source had the same effect.

In 1913 Spiethoff treated various dermatoses with serum taken from the patients themselves.

He drew 50 to 100 c. cm. of blood from the arm vein, separated the serum by centrifugalization, inactivated it by heating to 55 or 56 degrees for half an hour, and injected from 10 to 25 c. cm. into the patient's veins. This was repeated two to three times a week until six injections had been given. Ravaut went a step further; instead of injecting the patient's serum he simply re-injected his blood. This he found to be as efficacious as the serum.

Though the two methods give similar results the author believes they obtain them by a different mechanism. In a recent work Widal, Abrami, and Brissaud state that Ravaut's method of auto-hæmotherapy owes its effect to non-specific desensitization. Cheinisse believes that the results of Spiethoff's autoserotherapy are due to colloid shock. Widal and his collaborators have shown that blood serum introduced into the circulation acts as a foreign protein. This assumption is strengthened by the fact that autoserotherapy was used successfully in a series of infectious diseases including angina, gangrenous soft chancre with high fever, infectious erythema, and severe prostatitis with extensive infiltration of the pelvic wall. The difference in mechanism is important in determining the indications for the use of the two methods.

A. G. MORGAN, M.D.

Landauer, F.: The Treatment of Surgical Tuberculosis with Partial Antigens (Erfahrungen ueber die Behandlung der chirurgischen Tuberkulose mit Partialantigenen). *Ztschr. f. Tuberk.*, 1921, xxxiii, 261.

For details as to the method the reader is referred to the well-known works of Deycke, Much, and others. There are not many publications giving the results of the treatment of surgical tuberculosis with partial antigens. The author reports the use of this method in mild and moderately severe cases in conjunction with the usual surgical measures and roentgen-ray therapy. These cases included three of bone and joint tuberculosis, four of gland tuberculosis, and one of tuberculosis of soft parts.

The fat antibodies predominated over the protein antibodies. The intracutaneous reaction is rejected as unreliable. Landauer believes that partial antigen treatment is of value in many cases but is not any better than Koch's old tuberculin method and some others.

KOCH (Z).

Bier, A.: Protein Therapy (Heilenzuendung und Heilieber mit besonderer Beruecksichtigung der parenteralen Protein Koerpertherapie). *Muenchen. med. Wchnschr.*, 1921, lxviii, 163.

Bier states that he was the first to suggest protein therapy. He first injected blood from another species. The blood is broken down in the body into which it has been injected and when disintegrated acts as a stimulant to all the cells of the body, causing a curative fever. It affects more especially, however, the focus of inflammation—and almost all foci of disease are in a state of inflammation—

because the cells of this area have a greater irritability than the cells of the rest of the body.

Weichardt's theory of the activation of protoplasm helps to explain the action of the protein bodies, but is nothing particularly new as functional, nutritive, and formative stimuli were discussed in detail by Virchow. All the effects of protein therapy were learned long ago from the infusion of animal blood. Bier demonstrated the increased reaction of the inflamed tissue. New points he has observed are increased excretion of urine, increased excretion of milk, absence of severe thirst and dryness of the mouth, and the hæmostatic effect of the transfusion.

With the introduction of the term "activation of protoplasm" there is danger that the question of curative fever and curative inflammation will be regarded as settled. Bier has previously shown that pain is not one of the characteristic cardinal symptoms of inflammation, but is only one of the results of the injury caused by the inflammation; also that destruction of function is a result of the injury. He shows that both these conditions may be overcome by an increase in the inflammation. He points out that an inflamed part sometimes functions more actively than a part that is normal, as for instance the nasal mucous membrane in coryza. The focus of inflammation shows an increased irritability; it may react strongly to stimuli which would be only slightly stimulating to a normal organ.

It is true, as Schulz said years ago, that in protein therapy small doses have a stimulating action, large ones a paralyzing effect; that the effect varies in different persons and is different in the normal and the diseased person. Bier knew and proved long ago that the proteins act by becoming disintegrated. He knew also what is now being brought forward as new, namely, that an increase of the inflammation has a curative effect. It is only a question of changing a chronic into an acute inflammation. Just as a constricting bandage has a different action on a diseased and a normal limb, so do many other agents act differently on diseased and normal organs. It is all a matter of dosage. The practical advantage of protein therapy over the use of other remedial agents with essentially the same effect is that in the former the dosage is easily controlled and there are few unpleasant by-effects.

HOLMEIER (Z).

BLOOD

Butsch, J. L., and Ashby, W.: Factors in Reactions after Blood Transfusions. *N. York M. J.*, 1921, cxiii, 513.

Seven hundred and thirty-seven transfusions were studied by the authors to find an explanation of the reaction. The sodium citrate method which is used routinely in the Mayo Clinic was employed and a uniform technique of observation was carried out.

The cause of reactions was approached from the points of technique, the factors intrinsic to the

patient, and the factors involving both the patient and the donor.

It seemed possible that a small amount of hæmolysis of the first few cubic centimeters drawn might take place and a toxic product might be released. After about 50 c.cm. of the blood had been run into the citrate solution portions were centrifugalized and the supernatant fluid was observed for hæmolysis. In the 3 cases showing hæmolysis no connection was found between it and the reaction to transfusion.

The omission of saline solution which had been used in transfusions previously caused no decrease in the numbers of reactions. It was therefore assumed that chills from the saline had not been frequent. The washing of all utensils in strictly neutral water caused no improvement in the percentage of reactions. Neither did the treatment of new rubber tubing recommended by Stokes and Busman give results to indicate that such tubing had been an important factor in transfusion reactions. Desensitization of the patient was attempted by protracting the transfusion time to thirty minutes. In 4 patients thus treated there were 2 severe reactions.

Certain points regarding the condition of the patient were then observed. It was found that the tendency to reaction was least when the initial temperature was normal and increased with an increase in the initial temperature. In 265 cases the hæmoglobin percentages showed a definite relation to transfusion reactions, the lower percentages giving the greater number of reactions. In a series of 11 patients receiving from 3 to 7 transfusions none developed hæmolysis against like group corpuscles. Previous transfusions apparently have no desensitizing effect. The lower percentage reactions obtained in some instances in second and third transfusions in a series of 84 cases appeared to be due to factors such as improved hæmoglobin, temperature, and possibly blood volumes.

In studies on both the patient and the donor the slight possibility of intergroup agglutination was eliminated by 120 tests in which no evidence of agglutination was found. Precipitin tests in 61 cases were negative, and there was no evidence of any intrinsic compatibility or incompatibility between a given patient and donor. The most interesting study, although the results were negative, was that of the effect of the digestive period on the reaction. A certain proportion of the patients and donors were fasted previous to and following transfusion.

MARTHA ALDRICH.

Sanguinetti, A.: The Mechanism of Adrenalin Leucocytosis (Il meccanismo produttore della leucocitosi adrenalina). *Policlin.*, Roma, 1921, xxviii, sez. med., 97.

In 1914 Abl showed that the injection of a milligram of adrenalin in cases of hæmolytic icterus and leukæmia is followed by a marked reduction in the size of the spleen. Soon afterward Sanguinetti studied the blood changes caused by the injection of

adrenalin in cases of leukæmia, hereditary syphilis, chronic tumor of the spleen of unknown origin, and malaria.

He found that the spleen decreased in size, though not to the extent observed by Abl. This decrease followed the injection almost immediately, occurring before the rise in arterial pressure. The spleen returned to its original size soon after the blood pressure had returned to normal. After the decrease in the size of the spleen there was an increase in the red and white corpuscles which reached its maximum within thirty to forty minutes. The increase in the leucocytes was greatest in the cases of leukæmia, rising to twice, and in one case to three times, the former number. An increase in the mononuclears involving a decrease in the percentage of polynuclears was noted in every instance. In the cases of leukæmia there was an increased percentage of immature forms.

There has been considerable discussion regarding the cause and significance of this increased leucocytosis caused by adrenalin. The author discusses the literature of the subject, giving the conclusions of various writers. A change in the leucocyte count is caused by very many different factors, such as digestion, inanition, pregnancy, parturition, epileptic attacks, tetanus, stimulation of the skin by the faradic current, and change of temperature. The changes due to cold seem to be analogous to those caused by adrenalin. Cold increases the number of leucocytes, while heat decreases it. The author reviews also the literature of this phase of the subject. To determine whether the change in the number of leucocytes associated with changes of temperature was due to changes in the blood-forming organs, Rovighi gave local baths of different temperatures. He found that the leucocytosis of the regional vessels was changed. This fact indicated that the variation was due to changes in the blood current from the capillaries to the tissues.

In the belief that adrenalin leucocytosis also is due to circulatory changes rather than to changes in the spleen or other blood-forming organs Sanguinetti carried out experiments to determine whether the injection of adrenalin in a narcotized dog would cause an increase in the white cells in the splenic vein before this increase appeared in the peripheral capillaries and whether there would be any increase in the number of leucocytes in the lymph flowing from the thoracic duct. He also examined patients to discover whether a local vasodilatation would cause the disappearance of the adrenalin leucocytosis and whether a leucocytosis of the capillaries of the finger is associated with a relative leucopænia of the veins of the forearm. He gives the details of his experiments and sums up his conclusions as follows:

The blood from the capillaries of the ear of the dog showed a marked increase in the number of white cells, while blood taken from the splenic vein immediately before showed a progressive decrease in the numbers of red and white cells. The increase

in the leucocytes in the capillaries of the ear of the dog was not preceded by any increase in the white cells of the lymph from the thoracic duct. In the clinical cases a cold bath of one hand (at 40 degrees for five minutes) caused a decrease or the disappearance of the adrenalin leucocytosis. While there was a marked increase in the leucocytosis of the capillaries of the finger, there was no change in the vein of the arm.

From these facts it seems evident that adrenalin leucocytosis is due to local changes rather than to an alteration in the whole volume of the blood; that it is due to the constriction of the small vessels and the capillaries caused by the adrenalin. In normal persons the changes may be slight if the examination of the blood is made before the adrenalin has had time to act on the peripheral vessels or the quantity of adrenalin used was insufficient. While pressure on abdominal organs may give rise to an increase in the number of red and white cells in the general circulation when these organs are affected by stasis, the increase is due as a rule to changes in the capillary circulation. The author admits that it is difficult to explain the relative lymphocytosis on this hypothesis but claims that this fact does not affect the validity of his general statements.

Sanguinetti proposes to carry out further experiments to show that certain characteristics of the cells themselves, their specific weight, viscosity, etc., determine their special distribution in the capillary region in which the circulation is profoundly changed by the action of adrenalin. Another point in favor of his hypothesis is that in the capillaries the mononuclears are increased and the neutrophils are decreased, while in the veins there is a relative increase of neutrophils and a decrease of mononuclears. The article is supplemented with a bibliography of thirty-five titles.

AUDREY G. MORGAN, M.D.

BLOOD AND LYMPH VESSELS

Martinez, F. F.: Abdominal Arteriosclerosis and Obliteration of the Mesenteric Arteries (La arterio-esclerosis abdominal y la obliteración de las arterias mesentéricas). *Semana méd.*, 1921, xxviii, 297.

When the patient was first seen the symptoms suggested acute peritonitis due to perforation of a gastric ulcer. Although more than thirty-six hours had elapsed since their onset, it was decided to operate, but the patient died while the preparations were being made.

Autopsy showed the stomach to be absolutely normal without the slightest sign of ulcer or perforation. The greater part of the intestine also was normal, but in the center was a much distended, thick, and hard loop with a gangrenous surface 8 cm. long which involved its entire circumference. The contiguous mesentery was hard and thickened. The veins were normal, but the arteries in this site were hard, rigid, and thick, and in some points solid. The condition was therefore diagnosed as intestinal

arteriosclerosis which had led to obliteration of a branch of a mesenteric artery.

The author discusses the etiology, symptoms, and diagnosis of abdominal arteriosclerosis.

Occlusion of the mesenteric vessels should be suspected whenever there is paroxysmal abdominal pain with blood in the vomitus and hæmorrhagic diarrhoea followed by intestinal occlusion. Occasionally, however, the hæmorrhagic character of the vomitus and fæces is absent. The majority of the known cases were diagnosed during laparotomy or at autopsy.

When surgical intervention is called for the zone occluded by hæmorrhagic infarcts must be widely resected.

W. A. BRENNAN.

Holst, S. F.: Ligation of the Hepatic Artery (Unterbindung der Arteria hepatica propria). *Norsk mag. f. Lægevidensk.*, 1920, lxxxi, 1182.

Gastric resection was performed on a man of 66 for cancer of the stomach. In order to remove the "suprapyloric" gland, which was the size of an almond, lay just above the pylorus, and infiltrated by the cancer, the ligature was placed at the upper end of the gland. The ligatures enclosed a vessel running downward which was thought to be the gastroduodenal artery. After it had been cut it was found to be the hepatic artery. The main trunk of the common hepatic artery ran, as usual, along the upper border of the pancreas. After giving off the right gastric artery, the vessel continued in an arch downward because of retraction and gave off the gastroduodenal artery. The hepatic artery had been cut on the side toward the liver from this point. An attempt to suture it failed because of the presence of arteriosclerosis. There was no icterus after the operation and the quantities of ammonia and amino-acids in the urine were normal. Death occurred eight and one-half days later.

At autopsy the liver was found to weigh 1,150 gm. The left lobe was small, flabby, and wrinkled; on the surface were large necrotic spots, some of which were hæmorrhagic. The right lobe was of the usual size and shape and, on the whole, normal, showing only a few hæmorrhagic spots. To the median side of the impermeable suture of the hepatic artery was an obturating thrombus 3 cm. long. After careful dissection a small artery was found in the ligamentum teres hepatis which extended up into the right lobe of the liver. This explained the satisfactory functioning of the liver after the operation and the pathologic finding on autopsy but made the fatal outcome rather surprising. No intra-abdominal reaction was noted. The author suggests that death might have been due to toxæmia caused by the partial necrosis of the liver.

KORITZINSKY (Z).

Haubenreisser, W.: Lymph Drainage in Elephantiasis Cruris (Lymphdrainage bei Elephantiasis cruris). *Zentrabl. f. Chir.*, 1921, xlviii, 42.

The essential point in Payr's operation is that, in addition to bringing about a connection between the

subcutaneous and the deep intermuscular lymph tracts, a result accomplished also by the methods of Lanz, Oppel and Kondoleon, the muscles are utilized in such a way that their action hastens the lymph stream. The technique is described as follows:

After the elephantiasis has been decreased by raising the leg, bandaging, massage, and similar measures, an incision is made down to the fascia on the inner and outer sides of the leg, beginning about three finger-breadths above the head of the fibula. The fascia is laid bare along the whole length of the incision, and a strip of it, 5 to 8 cm. broad, is dissected free from the muscle and excised. Hæmostasis is then effected, the lower, hard layer of the subcutaneous cellular tissue on both edges of the wound is excised, and the muscles which have been laid bare are sutured to the free edges of the fascia and the subcutaneous cellular tissue with silk sutures 5 cm. apart. The skin is then carefully sutured, a sterile dressing and a rubber bandage are applied, and the leg is placed in suspension.

The same operation is used for elephantiasis above the knee. The wounds heal by first intention. On the second or third day the swelling subsides and the pain ceases. The after-treatment consists of massage, electrical stimulation, and exercise.

In the past eight years six cases have been operated on in this way. The first patient showed marked improvement six months after the operation. Four other cases have been examined since. One of the patients, a woman operated on in 1914, said that the leg had increased in size but that the pain was only slight. In the three other cases the circumference of the leg decreased from 39, 47, and 39.5 cm. to 36, 40.5, and 38 cm. respectively. The last patient showed normal circumference of the leg the day after the operation, but developed erysipelas.

KEMPF (Z).

GENERAL BACTERIAL INFECTIONS

Thomson, D.: Research on the Biochemistry of Germs and Other Proteins, with Special Reference to the Problems of Immunity. *Lancet*, 1921, cc, 795, 849.

In the preparation of gonococcal vaccine for the army the author noted that gonococci dissolved in 10 per cent normal sodium hydrate solution were again precipitated by the addition of acids as a protein substance which retained the antigenic properties of the gonococcus itself. Injections of this precipitate show that it is about fifty times less toxic than the ordinary gonococcus vaccine and, with the increased dose tolerance of the patient, confers many more units of immunity. The acid supernatant filtrate contains the toxic element of the gonococcus. A protein substance in this is precipitated by picric acid, ammonium sulphate, or absolute alcohol. On injection into patients with

gonorrhoeal urethritis this substance greatly increases the urethral discharge and causes an intense local reaction even when it is neutralized before injection.

The non-toxic gonococcus vaccine is composed of a gonococcus meta-protein, while the acid supernatant fluid contains primary and secondary gonococcus proteoses. Ox heart and pea flour also were found to contain proteins splitting up into meta-protein, primary proteose, and dentero-protease.

Experiments on gonorrhoeal patients demonstrated that the primary and secondary proteoses are not more toxic than the meta-protein. The proteoses, however, have a strong provocative effect on a latent focus, as in chronic urethritis or iritis. They may be of value as a criterion of cure in urethritis, but are too dangerous to be used in iritis. The proteoses have strong antigenic power in the complement-fixation test, especially when they are precipitated with absolute alcohol.

Although all germs, and apparently all proteins, were found to be more or less soluble in alkali, some, such as the gonococcus, appeared to dissolve entirely, while others, such as diphtheroids and the tuberculosis bacillus, dissolved only partially. In every instance, however, a considerable portion was dissolved in the alkali; all gave the protein color tests. Meta-protein was always thrown out by the addition of acids, and the acid supernatant fluids always contained proteins resembling proteoses.

Further analysis of the tuberculosis bacillus showed it to be made up of four components: (1) alkali-soluble meta-protein and proteoses, (2) acid-soluble meta-protein and proteoses, (3) an alcohol-soluble substance, and (4) a chloroform-soluble substance.

Analysis of large quantities of other bacteria showed them to be made up in varying proportion of Components 1, 2, and 3, as the tuberculosis bacillus, but not all contained the chloroform-soluble element. The author presents volumetric tables for six types of bacteria.

Further investigations on patients showed that the acid-soluble and alcohol-soluble components have as good antigenic powers as the alkali-soluble component. This apparently disproves Pick's theory that the alcohol-soluble "lipoids" are toxic and non-antigenic.

The second part of the article is given over to a detailed description of the preparation of detoxicated vaccines from the various non-toxic elements of the bacteria. Thomson uses a volumetric method to determine dosage. In comparing his own method of extracting the poison from the germs and other proteins with that of Vaughn, he concludes that the former is superior as it does not necessitate boiling and consequently there is no reduction in the antigenic power of the non-toxic residue. His work on the toxins themselves is incomplete, but he is able to show a striking similarity between the toxins of germs obtained in the detoxicating process and the toxic substances in the urine which probably repre-

sent the toxic waste products produced in the tissue metabolism of the living body.

The endotoxic substance has no value in the production of immunity to a given bacterium. It is chemically different from the exotoxins such as those of diphtheria, tetanus, and snake venom, as it is different from the non-toxic protein substance in the germ body itself. The idea that the severity of the reaction to a given protein substance is an index of its immunizing power is erroneous.

The author discusses the compound nature of protein antigens and gives a probable explanation of collateral immunity and non-specific vaccine therapy. It is recognized that typhoid vaccine, the proteins of milk, proteoses, and other protein split-products are therapeutically beneficial in gonorrhoeal rheumatism and similar conditions. This has been explained on the basis of "protein shock," and the conception that the temperature rise is in part responsible for the benefit inasmuch as it has been shown that overheated animals are more resistant to bacterial infection and produce antibodies more abundantly than those at a normal temperature.

In explanation of collateral immunity Thomson says that all proteins contain the same alkali-soluble, acid-soluble, and alcohol-soluble substances, but the amounts vary with the type of tissue or bacterium under consideration. The alkali-soluble and acid-soluble substances from proteins are complex and made up of several types of proteins which may be separated by fractional precipitation. Therefore the antibodies produced from any specific protein or germ will be mostly against the dominant fraction. On this basis the author explains the greater benefit of specific vaccine therapy.

FRANK S. SCHOONOVER, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Merritt, E. A.: The Possibilities of Intravaginal X-Ray Therapy, with a Description of the Technique. *J. Radiol.*, 1921, ii, 29.

While radium is superior to the X-ray in the treatment of cavities, it is not within the reach of all, and even when it is available there are some cases in which the roentgen rays would be preferred if they could be used conveniently. Therefore the author has devised a technique which renders the vagina and cervix readily accessible with comparatively little discomfort to the patient.

The patient is placed in the dorsal position with the hips well elevated. The thighs are flexed to a right angle to the body, abducted, and held thus by overhead suspension. A specially constructed cylindrical glass speculum with an aperture of $1\frac{1}{2}$ in. is inserted into the vagina through a square of lead large enough to protect the perineum. The tube is placed in position with the treatment cone practically in contact with the external genitalia, care being taken to pull aside the high-tension feed wires so that they will not come into contact with the patient. At a 12 in. distance, an intravaginal area,

3 in. in diameter, receives the full intensity of radiation.

A case of basal-celled carcinoma of the cervix, which is described in detail, was treated in this manner with marked benefit. When first seen it was inoperable; after about six months of treatment, during which time the patient received at intervals a total dosage of one hour and fifty minutes of unfiltered roentgen rays from a Coolidge tube passing 6 ma. at an anode cervix distance of 12 in. backing up an 8-in. gap for fifteen and twenty minutes at each treatment. In addition to this, cross-firing through skin areas — four anterior and four posterior — was resorted to with the ordinary deep-therapy technique at the usual intervals.

The very definite improvement in the appearance of the growth at the time of the second intravaginal raying left no doubt that the malignant cells were rapidly responding to the rays directed into the vagina as the cross-firing from without was wholly inadequate to have caused any material change in this brief period.

ADOLPH HARTUNG, M.D.

Carman, R. D., and Carrick, W. M.: The Roentgenological Aspects of Osteitis Deformans (Paget's Disease); with Reports of Fifteen Cases.
J. Radiol., 1921, ii, 7.

The authors present the histories and the clinical and roentgenological findings of 15 cases of osteitis deformans seen at the Mayo Clinic among 237,000 admissions in six years. Four cases were at first diagnosed as bone metastasis but further study and re-examination of other bones led to the correct diagnosis of Paget's disease. Paget, in 1876, first reported 5 cases; since then, approximately 250 have been reported.

Arteriosclerosis, syphilis, trophic disturbances, and faulty metabolism have been mentioned but not substantiated as the cause of the disease. The skull and long bones are most frequently affected. Softening and thickening of the bones with bowing of the weight-bearing bones are first seen. These changes are followed by the production of poorly calcified bone which takes on an ivory-like hardness after a period of years.

The bones of the skull usually show marked thickening, in some cases to four times the normal; the inner table is dense and the outer table finely porous, producing in the roentgenogram a fuzzy appearance of the calvarium. Nodular deposits of bone are irregularly distributed over the vertex. These cranial changes are of great value in the differential roentgenological diagnosis.

Clinically, osteitis deformans is a disease of middle or late life. In this series the age varied from 37 to 70 years. Males are more frequently affected than females. The onset is insidious and slowly progressive. Pain of a neuralgic or rheumatic type or thermal parästhesias over the tibiae may be the first symptom. Bowing of the legs is an early change when the lower extremities are affected. The

patient's general appearance and posture are very characteristic. The size of the head, which is carried forward and is triangular in shape, is increased. There is loss of height, the shoulders are rounded, the chest is sunken, and the abdomen pendulous. The legs are bowed forward and outward, and the gait is awkward. Spontaneous fracture in these cases is rare.

The course of the disease is protracted. Death results from some intercurrent disease.

Roentgenological findings show porosis, new bone formation, and hyperostosis. Later, marked sclerosis with a decreased permeability to the X-ray is found. Osteomalacia, syphilis, osteomyelitis, and metastatic malignancy must be distinguished. The first three are not difficult to rule out.

Metastasis of the osteoplastic type may be easily mistaken from the X-ray standpoint for osteitis deformans, especially when the latter occurs in the lumbar spine and sacro-iliac region. Here a very careful search should be made for a primary malignant source, and other bones, particularly the skull, should be roentgenographed for evidences of osteitis deformans. Another differential point is the fact that the bodies of the lumbar vertebrae are flattened and possibly widened to some extent in osteitis deformans, whereas in malignancy there is little if any change in their shape.

The following conclusions are drawn:

1. A clinical diagnosis of osteitis deformans is not always possible, especially in the early stages. In the cases of patients complaining of obscure bone pain with deformity a careful roentgenographic study should be made of many bones.

2. Metastasis to the bone must be considered when osteitis deformans is diagnosed in the spine and pelvis.

3. Many bones are involved by the disease process. Bone changes in the skull are pathognomonic.

MERLE R. HOON, M.D.

Hickey, P. M.: The Intralaryngeal Application of Radium for Chronic Papillomata. *Am. J. Roentgenol.*, 1921, n.s.viii, 155.

The patient had had a papilloma of the larynx for ten years. Examination showed the lumen of the larynx to be occluded with papillomatous masses which partially covered the epiglottis and false vocal cords. Efforts to remove the growth with forceps through a Jackson laryngoscope, by surgical methods or local applications failed. Incomplete removal seemed to stimulate its growth. It finally became so large that it obstructed the larynx and an emergency tracheotomy was necessary. A thorough course of X-ray treatment then given was without benefit. External applications of radium given later were also without apparent beneficial results.

The patient wore the tracheotomy tube for five years. Radium was then applied directly to the growth. Attempts to introduce it from above proved unsatisfactory. The tracheotomy tube was therefore removed and a flexible bougie passed into the

trachea through this opening up through the mouth, a strong thread was attached to the end of the bougie and drawn down through the larynx and tracheotomy opening, and a 25 mgm. capsule of radium attached to this thread was drawn down until it rested in the upper opening of the larynx. The radium was left in position for one and one-half hours. The ends of the cords were fixed externally. Sedatives and local applications were given to prevent coughing.

Considerable reaction followed this treatment, but the local condition improved considerably. A second application was then given, the tube being placed in the larynx for one hour. This was followed by a mild reaction and partial disappearance of the tumor.

Two months later a third application similar to the second was made. The growth then disappeared almost entirely, only a few tags remaining. The patient was able to dispense with the tube for a half day at a time.

In applying radium as described it is necessary to cocaineize the larynx and trachea thoroughly, and to give an anodyne to prevent the cough reflex. Fluoroscopy is of aid in placing the tube properly. The bougie is best introduced from below upward.

This method of treating laryngeal growths has been used for cancer of larynx, but the technique was modified somewhat to meet the conditions present.

In cases in which it is desired to avoid a tracheotomy, the radium capsule may be attached to an intubation tube and applied in the manner described.

W. L. BROWN, M.D.

MILITARY SURGERY

Gilberti, P.: War Wounds of the Skull (I cranici di guerra). *Clin. chir.*, 1920, n.s. ii, 865.

The author performed 171 operations for head injuries during the war, including 39 craniectomies and 30 plastic operations. He gives the histories of 16 of the cases.

Early operation is indicated in practically every instance. There was practically unanimous agreement on this point at the Surgical Congress in Paris in 1916. Scalp wounds should be incised and examined carefully for possible lesions beneath them. Absence of injury to the outer table of the skull does not prove that there are no injuries underneath it, and in several cases the author has felt justified in opening the skull because of the clinical symptoms though no injury was apparent on the surface. He has found both supradural and subdural hæmorrhages in such cases.

If the skull is fractured, operation should be performed at once in a manner as simple as possible. Bone fragments should be removed, and in some cases of extensive loss of bone a plastic operation is indicated. Sometimes it is necessary to make a larger breach in the bone than is already present

to facilitate inspection, to prevent wounding the dura, or to relieve pressure.

The author uses few instruments. Those he employs are of the simplest, not only because this was rendered necessary by war conditions, but because it is possible to operate more rapidly with simple instruments, a factor of prime importance in brain surgery. Every effort should be made to spare and to preserve the dura mater. If it is intact it should not be incised unless this is rendered necessary by subdural hæmorrhage. If it is opened or torn every bit of it which shows signs of vitality should be preserved.

For operations on the skull Gilberti prefers general to local anæsthesia. In some of his cases no anæsthetic at all was given, advantage being taken of the patient's unconsciousness. He has used semi-circular, crucial, L-shaped, and H-shaped incisions of the scalp, but in general prefers a linear incision.

Examination for foreign bodies in the brain should be made with the X-ray. They should be removed with as little contusion of the brain substance as possible. Hæmorrhage from the longitudinal sinus should be controlled by tamponing, the tampons being removed after four or five days.

There are various methods of cranioplasty. From his experience Gilberti concludes that the best method is that of Righetti-Durante in which the breach in the skull is covered with a flap of bone and periosteum from the patient's skull. In 7 cases in which he used this method complete recovery resulted in 6. He believes that operations on the brain and skull are much less apt to be followed by late effects, such as Jacksonian epilepsy, if they heal by first intention. Therefore it is of the utmost importance to operate rapidly and under the strictest asepsis. The patient should be kept under observation for a long time as Jacksonian epilepsy or psychic complications may not develop until later.

A. G. MORGAN, M.D.

LEGAL MEDICINE

Aggravation of Injury by Physician's Mistake or Negligence. *Yarrough vs. Hines* (Wash.), 192 Pac., R., p. 886.

The direct result of the plaintiff's injury was a fracture of the lower end of the fibula. His foot was put in a plaster cast and he was confined to the hospital for several weeks. About six months after the injury there was shortening of the tendon of Achilles which drew up the heel and caused dropping of the toes, a condition commonly known as "claw-foot" or "toe-drop."

The testimony very conclusively indicated that the condition of the foot was not necessarily the result of the injury, but might have been caused by improper placement of the foot in the plaster cast or some other improper treatment of the original injury. However, it was of little importance whether the plaintiff's condition was the result of the original injury or an injury sustained in connec-

tion with the treatment of the original injury for the law states definitely that if the injured party in good faith and in the exercise of reasonable care employs a physician to treat his injury and the injury is aggravated through the mistake or negligence of his physician, such negligence or mistaken treatment of the physician does not become an intervening cause and the injured party may recover damages for the injury he sustained, including the aggravation thereto resulting from the mistaken or improper treatment.

J. A. CASTAGNINO.

Complaint For Not Obeying Order of Health Officer—Proof of Order. *City of Roslyn vs. Pavlinovich (Wash.), 152 Pac. R., p. 885.*

The complaint charged that on or about October 23, 1918, the defendant committed the offense of violating Section 1 of Ordinance 161 of the City of Roslyn in that he did willfully and unlawfully refuse, fail, or neglect to comply with the legal order of the health officer of the city in that he permitted people to congregate at his place of business at No. 12 Pennsylvania Avenue, in said city, and play cards therein, etc. Section 1 of the ordinance mentioned provides that it "shall be unlawful for any person to refuse, fail, or neglect to comply with any legal order of the health officer" of the city. It seemed plain to the court that the complaint very directly charged that the defendant violated that ordinance by failing and refusing to obey certain health orders and regulations made by the city health officer. This was sufficient to charge a misdemeanor.

J. A. CASTAGNINO.

Sufficient Indictment of Unlawful Sale of Cocaine. *Dean vs. United States, 266 Fed. R., p. 694.*

An indictment charged the defendant with purchasing, selling, dispensing, and distributing cocaine in and from a certain tin box which was not the original stamped package containing said cocaine, and with having in his possession said tin box containing cocaine which did not have affixed thereon appropriate tax-paid stamps as required by the Harrison Narcotic Law. The Harrison Narcotic Law states that such purchase or sale, except from original stamped packages, is an offense. The possession of unstamped packages is prima facie evidence of such offense.

J. A. CASTAGNINO.

Amputation by the Forbes Operation Deemed at Ankle. *Jones vs. Continental Casualty Co. (Iowa), 179 N. W. R., p. 203.*

The plaintiff had an accident policy issued by the defendant company which promised to pay him an indemnity for the loss of either foot, the term "loss" meaning complete severance at or above the ankle. His foot was accidentally crushed under a car wheel. Amputation was necessary and was effected by what was termed the "Forbes operation," the line of separation being between the cuneiform and scaphoid bones and through the cuboid. The court held that the words used in the policy to indicate the

point of severance were, at best, ambiguous, and that to carry out the purposes intended — that is, to pay indemnity for the loss of the plaintiff's foot — it could be properly found in this case that the severance was at the ankle.

J. A. CASTAGNINO.

City Not Liable for Wrongful Acts of Officers. *Franklin vs. City of Seattle (Wash.) 152 Pac. R., p. 1015.*

The complaint alleged that the city of Seattle had created and maintained a board of health and a department of police; that these two departments conspired together to arrest certain persons accused by them of having some infectious or contagious disease; that it was a part of the conspiracy to place the person so arrested in the city jail and to turn him over to the board of health which would make blood tests and give treatments for diseases which the person under arrest did not have and under pretense of such treatment and the necessity thereof would keep such person in confinement in the board of health department of the jail.

The complaint further alleged that police officers of the city unlawfully and maliciously entered the home of the plaintiff and, without any warrant therefor, arrested her and forcibly took her into custody and to the city jail, and there falsely and maliciously caused her to be charged with being a disorderly person and set opposite her name the letters "B. T." meaning "blood test"; that as a part of the conspiracy the health officer took charge of her and forcibly took from her arm quantities of blood for the purpose of making a blood test; that thereafter the health officer maliciously and falsely charged her with having an infectious and contagious disease when, in fact, she had no such or other disease, of which fact the health officer had full knowledge; and that, without authority of law, the plaintiff was maliciously confined in jail with other prisoners for more than a year.

The question raised was: Did these facts state a cause of action against the city? The court concluded that they did not. The only direct connection the city had with these transactions was that it created the board of health and appointed its officers, created the police department and made appointments thereto, and owned the jail. Everything else was done by the health officers and the policemen. They, and they alone, were guilty, if anyone was, of all the wrong, fraud, conspiracy, and maliciousness charged in the complaint. Under these facts the city was only discharging a governmental duty cast on it by the state and was not liable. The same immunity applies to the quarantining of persons as in such cases the city is acting for the state.

J. A. CASTAGNINO.

Liability of Physician for Negligence of Assistant — As to Substitutes. *Mullins vs. Du Vall (Ga.), 104 S. E. R., p. 513.*

The defendant was charged with malpractice in treating the plaintiff for pellagra, and a recovery of

damages was asked for the breaking in her arm of a hypodermic needle used on her by a colored assistant to the defendant. It appeared from the petition that when the patient called at the office of the physician to receive the usual hypodermic injection it was at the proper time and in accordance with the regularly adopted routine of treatment, as prescribed and employed by the defendant physician; that the relation of physician and patient had not terminated as the adopted course of treatment, the nature of which was unknown to the plaintiff, was still in process of regular administration and no provision had been made for its discontinuance, but, on the contrary, the plaintiff had been told that it was to be given by his attendant or servant in charge whenever the defendant might be absent from his office.

It is a general proposition of law that where one holds another out as his special agent, the principal is bound by the agent's apparent authority to do the particular thing thus authorized and to employ all usual and necessary means which may be reasonably required in the due, proper, and ordinary performance of the particular purpose of the appointment. A physician is liable for the negligent acts of one who is acting as his agent or assistant.

When one physician or surgeon sends another as his substitute to treat or to perform an operation on a patient, and the services of the substitute are accepted, the patient will be presumed to have reposed confidence in the professional capacity of the substitute, not as an agent, but as the principal, and will be assumed to have relied on him as a physician

to exercise his own knowledge, skill, and discretion. Thus, when a physician, on leaving town or in other case of need, recommends or even employs another physician or surgeon to treat a patient for him, he would not, in the absence of what would amount to negligence in the selection, be liable for the negligence or lack of skill of the substitute practitioner. In the instant case, however, the physician did not delegate his functions and duties as a physician.

In authorizing or directing the patient to allow his employee to perform for him and in his stead this particular service in his absence, the defendant did not renounce any part of his functions as the sole physician in the case. Nothing whatever was left to the discretion of the attendant since what the treatment was to be and when it was to be administered were determined by the line of treatment adopted by the physician himself and the authority given the attendant related solely to the one definite and specific art, the mere physical administration of the prescribed treatment. So far as the question of the amount of skill required by the act was concerned, the direction given amounted to his assurance as an expert that the act was not of such character as to require in his absence the services of another physician, but that in such contingency the patient might safely receive the treatment as rendered for him and on his behalf by his office attendant or servant. It was on such implied assurance, rather than on any confidence in the professional skill and discretion of the defendant's servant, that the patient had a right to rely.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Mayer, A.: The Modern Treatment of Carcinoma of the Uterus (Ueber das Uteruscarcinom und seine moderne Behandlung). *Muenchen. med. Wchnschr.*, 1921, lxviii, 168.

The most favored operation for carcinoma of the uterus is the Freud-Wertheim operation. This has been used for eighteen years in the gynecological clinic of Tuebingen University, during which period about a thousand cases have been treated.

Carcinoma of the uterus constitutes 5.6 per cent of all the gynecological cases at the Clinic; there are about 20 carcinomata of the body of the uterus to 80 carcinomata of the cervix.

In 161 carefully examined cases of cancer of the cervix a family history of cancer was given in 7.3 per cent. The author believes that inherited cancer may be due to a constitutional defect in the connective tissue. It was found that the lower classes have cancer much more frequently than the upper classes; there were eight times as many ward patients as private patients. One fact to be considered in this connection is that ward patients have on an average twice as many children as private patients. However, while there is no doubt that frequent childbirth is a factor in the production of cancer, the commonly accepted opinion that pregnancy hastens the growth and spread of carcinoma could not be confirmed. Neither was it determined whether age has any effect on the malignancy of cancer.

Sixty-five per cent of the cases at the Tuebingen clinic and 42 per cent at the Bumm clinic were operable. In Mayer's opinion one-third of the cases are inoperable. In two-thirds, operation may be attempted, but in about a fifth of these it results in death. Fifty per cent of the patients operated on are discharged cured, but three-fifths of these have a recurrence. Two-thirds of the cases with primary recovery and one-fifth of all carcinoma cases are permanently cured, that is, operation gives an absolute recovery in about 20 per cent.

Recurrence is due to involvement of the parametrium connective tissue and the glands by the cancer process. The prognosis is good if the parametrium is clinically free from involvement but doubtful if it is slightly infiltrated. If there is advanced infiltration the prognosis is poor. Only those glands should be removed at operation which are palpably enlarged.

In the cases reviewed no advantage of radiotherapy over operation was noted. The primary mortality of the former is not so great, but the mortality from recurrence is greater. The report of the Gynecological Congress in Berlin in 1920

stated that radiotherapy is useless in 30 per cent of the cases, that 70 per cent of those treated and discharged as primarily cured have recurrences, and that only 30 per cent are permanently cured. The cases upon which these conclusions were based were under observation for four years.

Mayer prefers operation and gives prophylactic radiotherapy afterward to prevent recurrence. Following the use of this method at Bumm's clinic 71.8 per cent of the cases were cured and 28 per cent had recurrences. A decision as to the value of postoperative prophylactic radiotherapy is as yet impossible as the number of cases observed is still small.

SCHENK (Z).

Schmitz, H.: The Treatment of Carcinoma of the Uterus by Radiation. *Am. J. Clin. Med.*, 1921, xxviii, 221.

The author groups cases of carcinoma of the uterus into five classes:

1. Cases shown by physical examination to be clearly operable.
2. Cases doubtfully operable — borderline cases.
3. Cases in which radical operation is impossible.
4. Cases so far advanced that any treatment is hopeless and of value only for palliation.
5. Cases of recurrence after an abdominal panhysterectomy: (1) local recurrence in the scar tissue, and (2) regional and metastatic recurrence.

In Group 1, a radical abdominal hysterectomy is indicated. If there are contra-indications to operation radium treatment may be given. In the borderline cases the results of surgical treatment have been rather disastrous; these cases form the ideal group for radium treatment. Radium treatment may be given alone or may be preceded by excochleation and cauterization. Improvement may be sufficient under such treatment to render excision feasible.

The clearly inoperable cases of Group 3 form the largest number and the same conditions prevail in these as in the cases of Group 2. Cases in Group 4 have been benefited only exceptionally by the radical treatment indicated for cases of Groups 1, 2, and 3. Recurrences after a local healing effected by radium are very refractory to radiation. Exceptionally an arrest and recession of the recurrence may take place following a second course of treatment.

The object in using radium and the roentgen rays is to apply an amount of homogeneous radiation for a sufficiently long time to destroy the deeply located pathologic processes within the pelvis without permanently injuring the healthy tissues and organs. A properly selected radiation applied to a correctly selected case of carcinoma of

the uterus, that is to say, one belonging to Groups 1, 2, or 3, will cause a visible and palpable decrease of the cancer area within three or four weeks. The cervix shows local healing, the uterus becomes palpable and movable, and the parametrial tissues become softer, reduced in size, movable, and very often free from induration.

Of a total of 208 uterine cancers treated with radium and the roentgen rays, 22 cases belonged to Group 2 and 82 to Group 3. Of those of Group 2, 13 were subjected to an abdominal panhysterectomy after a recession of the diseased tissues to an apparently normal state following radium treatment. Five of the latter patients are living and 5 have succumbed either to the operation or to a recurrence. No report has been received from 3. Nine patients belonging to Group 2 were treated with the rays only. Seven are alive and well; 2 died.

Sixteen patients belonging to Group 3 were subjected to panhysterectomy after an apparent local healing. Two of these are living, and 14 have succumbed or did not report. Twenty-five patients were subjected to an excochleation, cauterization, and radium treatment. Four are living, 18 died, and 11 have not reported. Forty-one patients were treated with radium only. Eighteen of these are well and free from recurrence. Eleven died and 12 did not report. Thus it is evident that patients of Groups 2 and 3 treated with radium only and not subjected to panhysterectomy, excochleation, or cauterization have a better chance for cure.

Limitations or contra-indications to the application of radium are given by the systemic reaction of the organism and the possibility of infection. Serious disturbances due to the absorption of cell constituents liberated by the degenerating and destructive action of the radium rays are intense weakness, apathy, anorexia, absolute loss of appetite, serious changes in the blood elements, especially leukopenia, and radium cachexia. These make an interruption of the treatment necessary. The danger of infection may be avoided by a correct dosage which degenerates the tissues gradually and avoids necrosis of the surface epithelium, especially of the rectum. Most careful asepsis must be observed in the application of the rays.

The reaction of carcinoma cells to radium rays depends on the histologic structure of the neoplasm. The changes caused by radium in squamous-cell carcinoma of the cervix, in the cells of the hornifying epithelioma, are cytolysis and karyorrhexis, vacuolation and granulation of protoplasm, destruction of the cell wall, destruction of the nucleus into amorphous debris, round-cell infiltration, and later, fibroblastic formation. The basal-celled epithelioma of the cervix is found mostly in the infiltrating variety of cervical carcinoma. Necrosis and connective tissue formation are the characteristic repair processes in this variety. The adenocarcinoma shows a tendency to further growth when exposed to the rays. However, it soon succumbs if the treatment is given correctly.

Detailed antemortem and postmortem studies of two cases of carcinoma of the cervix are given. The women died from intercurrent diseases subsequent to the administration of radium. Their pelvic organs were examined minutely.

The author arrives at the following conclusions:

1. Statistics of uterine carcinoma treated by radiation can be of value only if based on a proper grouping of the tumors.

2. The indications for the various modes of technique in treatment with radium must also be based on such a grouping.

3. The evolution of a correct and efficient technique is dependent on physical, anatomical, biological, and clinical observations.

ADOLPH HARTUNG, M.D.

Adler, L.: Operative and Radiotherapy of Cancer of the Uterus (Zur operativen und Strahlenbehandlung des Gebärmutterskrebses). *Strahlentherapie*, 1921, xii, 109.

Of 52 cases of inoperable carcinoma of the cervix treated with radium alone, 13 (25 per cent) remained free from recurrence from five to seven years. The results in cases operated upon were no better, the recoveries amounting to only 24 per cent. As an operative method Adler recommends the extended vaginal extirpation which has been in use for the past ten years at the Vienna University Gynecological Clinic. The mortality of this procedure is only 3.5 per cent. The results of radium treatment alone are not as good as those of operation.

Prophylactic after-treatment with radium by the old method did not markedly improve the results of operation. Formerly Adler began such treatment four weeks after the operation, placing the radium in the vault of the vagina six times at intervals of four weeks. He now introduces the radium into the wound cavity immediately after the operation. More recently intensive roentgen treatment has been given in addition. The number of cases free from recurrence after three years has been increased by immediate radium treatment from 52 to 61.8 per cent. Adler recommends, therefore, complete vaginal extirpation with the immediate application of radium to the parametrium and homogeneous irradiation of the pelvis with the roentgen rays.

JUENGLING (Z).

EXTERNAL GENITALIA

Fohr: Two Cases of Carcinoma of the Clitoris in Young Patients (Zwei Faelle von Klitoris-Carcinom bei Jugendlichen). *Fortschr. d. Med.*, 1921, xxxviii, 149.

The author reports two cases of cancer of the clitoris in patients 24 and 26 years of age. In the first case there had been for a long time a chronic skin disease of the face and extremities with intense itching (chronic neurodermatitis). In the course of this condition examination revealed a hard swelling of the clitoris of which the patient had not been

aware. At first it was impossible to make a differential diagnosis although several experienced dermatologists were called into consultation; there was a difference of opinion as to whether the growth was a condyloma accuminata or a carcinoma.

In spite of all possible treatment, including the use of radium and the roentgen rays, the patient's condition continued to grow worse. Ulceration finally developed with papillary growths which grew slowly at first and then more and more rapidly until they involved the greater and lesser labia and the pubic arch. There then could be no further doubt regarding the diagnosis of carcinoma.

The tumor and the inguinal glands were removed, the incision being carried into sound tissue. The wound was closed with drainage. Recovery was uneventful and after a short time the patient was discharged well. Three months after the operation, however, examination showed a small recurrence. This extended rapidly and caused death in six months.

In the second case there was also a chronic itching eczema of other parts of the body. Ultimately a tumor with ulcerated papillary edges developed on the clitoris, grew rapidly, and soon broke down. In this case, also, radical operation was performed and followed by radiotherapy. The latter, however, was not continued. Eight months after the operation there was a large nodule of cancer metastasis in the right inguinal region and the skin of the right thigh. Immediate roentgen and radium treatment improved the condition considerably, but the prognosis is very dubious.

BODE (Z).

MISCELLANEOUS

Kundrat, R.: Genital Tuberculosis in Women (Ueber Genitaltuberkulose des Weibes). *Arch. f. Gynaek.*, 1920, cxiv, 51.

The author reports 66 cases of tuberculosis of the internal genitalia and of the peritoneum. The tubes are infected more frequently than the uterus. Tuberculosis of the ovaries is rare.

There is nothing typical of tuberculosis of the uterus as regards the form of the organ, thickening of the serosa, or adhesions. The microscopic diagnosis, which is generally not difficult, is based on the epithelioid tubercles, the giant cells, and the caseation. In some instances, however, epithelial proliferations may cause difficulties in the differential diagnosis from carcinoma or other inflammatory processes. In gonorrhoeal or streptococcal salpingitis there are many polynuclear leucocytes in the folds of the mucous membrane, especially just beneath the epithelium, but in tuberculosis these are generally completely absent, at least in advanced cases. Examination for tubercle bacilli is often negative.

The first stage in tubal disease is simple catarrh; the second, the stage of miliary tubercles, passes gradually and without definite boundary lines into

conglomerate tuberculosis. This is followed by caseation, necrosis, and desquamation. In 3 of the cases reported there was extensive destruction of the mucosa of the uterus. In the rest, miliary and confluent tubercles were found. Some of the epithelioid cells were irregularly star-shaped and others spindle-shaped. Giant cells in all conceivable forms were found. Plasma cells were present in varying numbers. These are found in areas of inflammatory tissue reaction. There were many lymphocytes and granule cells, but few eosinophiles. In 2 cases tuberculosis of the adnexa was associated with appendicitis, and in 1, with carcinoma of the cervix.

The author believes it very improbable that there is a transition from tuberculosis to carcinoma. Primary tuberculosis of the female genitalia also is conceivable, but improbable. In spite of numerous animal experiments it has never been determined conclusively whether the tuberculosis is ascending or descending. The tube is first affected in genital tuberculosis. The peritoneum is generally infected from the tube, though the opposite also occurs.

The ovary has great resistance to tuberculosis. It is protected by the tunica albuginea and also chemically by the ovarian substance itself. Hypoplasia readily leads to tuberculous infection because the blood supply is decreased.

The article is supplemented with a bibliography of 65 titles.

THEODOR (Z).

Sachs, E.: Abdominal Operation for High Cervicovesical Fistulae (Ueber abdominale Operation hochsitzender Blasenervixfisteln). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1921, liv, 245.

The author illustrates his abdominal method of operating for cervicovesical fistula by a case report. In this instance the fistula was the result of an injury sustained during a transperitoneal cervical caesarean section. The patient was a rachitic primipara with a vagina so narrow that a vaginal operation would have been very difficult. The abdomen was therefore opened with a Pfannenstiel transverse incision. The adhesions between the uterus and the contracted bladder were freed and the bladder was dissected away from the anterior wall of the uterus. An opening in the bladder the size of a cherry communicated with a split 2 cm. long in the cervix.

The bladder was freed from the cervix and the hole in the bladder wall closed with three catgut sutures passing through only the serosa and the muscle. The opening in the uterus was closed with several button sutures and covered with the loose surrounding tissue. As the fistula was situated at the juncture of the cervix and body of the uterus the uterine peritoneum was also sutured over it. The next step consisted in pushing the bladder fistula down to a point far below the cervical fistula and suturing the bladder serosa to the cervix. The cervical fistula was then covered also by the bladder peritoneum and the latter was sutured above the cervical wound to the uterine peritoneum.

The two fistulæ were thus separated from one another and the bladder wound was brought into contact with healthy cervical tissue. The author used a retention catheter as he does in all cases of bladder fistula, but is not sure whether it was necessary. The operation was a complete success.

Sachs does not recommend abdominal operation for all bladder fistulæ but in this case it was indicated on account of the narrow vagina. He does not believe it absolutely necessary to suture the bladder; at least this is not the most important point of the operation. The essential factor is the separation of the two fistulæ so that both lie in normal tissue; the peritoneum interposed between them would probably serve of itself to close the opening in the bladder.

A. G. MORGAN, M.D.

Williams, J. W.: The Problem of Effecting Sterilization in Association with Various Obstetrical Procedures. *Am. J. Obst. & Gynec.*, 1921, 1, 783.

Sterilization in association with some obstetrical procedure was done on 44 out of about twenty thousand patients admitted to the obstetrical service of the Johns Hopkins Hospital.

In 29 cases it was effected in connection with some variety of cesarean section which in great part was undertaken on account of disproportion incident to contracted pelvis. In the remaining 15 it was effected earlier in pregnancy.

Of the 29 sterilizations effected at the time of labor 18 were associated with supravaginal hysterectomy. Of these, 14 were done at a second or third cesarean section performed on account of contracted pelvis, and 4 on account of serious disease. In 11 other patients sterilization was effected following cesarean section for various causes, chief of which was contracted pelvis. The operation consisted of doubly ligating the tubes and burying the uterine ends between the folds of the broad ligaments. The remaining operations — 6 supravaginal hysterectomies and 9 hysterotomies followed by tubal sterilization for diseases complicating pregnancy — were done during the course of pregnancy.

In a series of 58 supravaginal hysterectomies following cesarean section the body of the uterus was amputated in 18 instances (30 per cent) primarily for the purpose of effecting sterilization. Sterilization was effected, of course, also in the other 40 patients, but in these cases was only incidental to the operative procedure. The indication for the removal of the uterus was offered by various causes such as intrapartum infection, the presence of myomata, injuries to the uterus, extensive raw areas resulting from the separation of adhesions, disorganization of the uterine muscle by hæmorrhage associated with premature separation of the normally implanted placenta, atresia of the cervix, and other conditions.

In 14 of the 18 patients in whom sterilization was effected marked degrees of pelvic contraction afforded the primary indication for the cesarean section, while in the other 4 the pelvis was normal and the operation and subsequent sterilization were indicated by some disease which seriously threatened life.

While the ultimate results in all the cases here reported were satisfactory, Williams has recently attempted to effect sterilization by more conservative means, and in a certain percentage of cases he has done this by doubly ligating the tubes, opening up the broad ligaments, and burying the uterine end of each tube within them.

In this manner 11 patients have been treated, 2 at the first section, 4 at the second section, 2 at the second section preceded by a pubiotomy, and 3 at the third section.

In view of the steady improvement in the results following cesarean section it appears that at present routine sterilization at a second section is too radical, and indicated only under special circumstances. The procedure is justified at the third section. In such cases Williams allows the wish of the patient to influence him as to whether he effects sterilization by removal of the uterus or by burying the uterine ends of the tubes between the folds of the broad ligaments. If she does not desire to have menstruation stopped he effects tubal sterilization; otherwise, he removes the uterus.

In 2 instances the procedure was adopted for heart disease, in 3 for chronic nephritis, and in 1 for advancing tuberculosis. Six supravaginal hysterectomies were performed during pregnancy.

In 9 cases sterilization was effected during pregnancy by means of abdominal hysterotomy followed by ligation or excision of the tubes. In 1, the indication was mitral insufficiency with a history of repeated decompensation. In 3, tuberculosis afforded the indication for interference. In each instance the diagnosis and the necessity for interference were confirmed by a competent tuberculosis specialist. The duration of pregnancy varied from six to twelve weeks.

In the next 4 cases the indication was afforded by chronic nephritis. The patients were multiparæ who had presented a history of nephritic disturbance in previous pregnancies and entered the service with manifestations of chronic nephritis indicated by a blood pressure varying from 200 to 290 as well as other symptoms. In each instance it was felt that the pregnancy should not be allowed to continue as there was no probability that the condition could be cured and every likelihood that it would become accentuated in the future. It was therefore determined that the occurrence of future pregnancies should be rendered impossible.

E. L. CORNELL, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Cheinisse, L.: Extract of Corpus Luteum in the Nausea of Pregnancy (L'extrait de corps jaune contre les vomissements de la grossesse). *Presse méd.*, Par., 1921, xxix, 306.

The author reviews the treatment of the vomiting of pregnancy by means of ovarian extracts and more particularly by means of extract of corpus luteum. Stella introduced the use of ovarian extracts in such cases about fifteen years ago in Italy and obtained very encouraging results. In the United States, Hirst, in 1919, obtained 89.2 per cent favorable results (complete recovery in 65 cases and decided improvement in 34). In 8 cases the treatment failed, and in 4 the condition was aggravated. The extract was given by intramuscular injection. The 4 cases in which the treatment aggravated the condition were those of women with goiter. Hirst therefore concluded that goiter is a contra-indication. In France, Devraigne also reported good results from the use of ovarian extracts.

Very recently Hirst has reported that the intravenous method of injection is better than the intramuscular as the extract is more rapidly absorbed, much larger doses may be given, and the disadvantages of the local reactions which occur when a large dose is introduced intramuscularly are obviated. Intravenous injections have promptly checked vomiting when intramuscular injections have failed. Hirst states that in several hundred injections an anaphylactic reaction and an abortion occurred in one case each. Such reactions appear to be possible only when the patient is peculiarly sensitive to the injection of a foreign protein. W. A. BRENNAN.

Bartholomew, R. A., Sale, B. E., and Calloway, J. T.: The Diagnosis of Pregnancy by the Roentgen Ray: The Possibilities of the Procedure During the First Half of Gestation. *J. Am. M. Ass.*, 1921, lxxvi, 912.

This study was undertaken with the object of determining the earliest stage at which a diagnosis of pregnancy can be made by demonstrating portions of the foetal skeleton by means of the roentgen ray. The first centers of ossification appear at about the sixth or seventh week. After that time they become progressively more numerous and better developed.

Chief among the factors complicating the roentgen diagnosis of pregnancy are the thickness of the maternal tissues, the relatively slight density of the foetal bones early in pregnancy, the blood in the uterine walls (which has been estimated to absorb 60 per cent of the rays), the amniotic fluid,

the respiratory movements of the mother, the movements of the foetus, and the unequal distances of different parts of the maternal pelvis and the foetus from the plate.

Of first importance in determining the earliest time at which the foetus may be demonstrated in the uterus roentgenographically is the accurate determination of the stage of the pregnancy. The menstrual history, the time of onset of nausea and vomiting, the date of quickening, the height of the fundus, the date of delivery, and the weight of the baby form the most reliable basis. The authors find that most of the published reports of cases of early roentgen diagnosis of pregnancy will not bear close analysis. The earliest positive result was reported by Edling. In this case the roentgenogram showed the foetus at the end of the fourth month.

The investigation undertaken by the authors was made on a number of clinic patients with due regard to all the factors involved. Whenever possible, roentgenograms were made at intervals of one to several weeks after the third or fourth month of gestation until the foetal skeleton was demonstrated. The technique used in the average case consisted of an exposure of from four to six seconds with a 5-in. spark gap and the use of 25 milliamperes, a diaphragm, and a cone. Most of the patients were placed in the prone position, and in every instance the central ray was directed parallel with the pelvic axis. The case histories and roentgen findings in a number of the cases are reported in detail.

The total number of roentgenograms taken was twenty-four. The earliest stage of pregnancy studied was two and one-half months; the latest stage, about the end of the sixth month. From the end of the second to the end of the third month, one roentgenogram was taken and was negative. From the end of the third month to the end of the fourth month, five roentgenograms were taken and all were negative. From the end of the fourth month to the end of the fifth month, ten roentgenograms were taken and three were positive. From the end of the fifth month to the end of the sixth month, eight roentgenograms were taken and four were positive. In other words, during the third and fourth months no positive results were obtained; during the fifth month, positive results were obtained in one-third of the cases; and during the sixth month, positive results were obtained in one-half of the cases. The earliest positive result was obtained at the end of four and one-fourth months.

From these results it would seem apparent that the roentgen ray may be of value in the diagnosis of pregnancy at practically the same stage that the other three positive evidences are obtainable:

(1) the sound of the foetal heart beat, (2) palpation of the foetus, and (3) the foetal movements. However, in the second trimester of pregnancy its diagnostic value is limited by the fact that a negative result does not necessarily mean that the patient is not pregnant.

From a review of the literature and the results obtained in the series of cases reported, the following conclusions seem justifiable to the authors:

1. A positive diagnosis of pregnancy has been made by demonstrating portions of the foetal skeleton in the uterus as early as the end of the fourth month.

2. The earliest positive diagnosis in this series of cases was obtained at the beginning of the fifth month of pregnancy.

3. During the third month of pregnancy roentgenoscopy is uniformly negative.

4. A positive diagnosis may be obtained very exceptionally toward the last of the fourth month.

5. During the fifth month of pregnancy a positive diagnosis may be obtained in at least one-third of the cases.

6. During the sixth month a positive diagnosis may be obtained in at least one-half of the cases.

7. During the seventh, eighth, and ninth months of pregnancy a positive diagnosis should be obtained in the great majority of cases.

ADOLPH HARTUNG, M.D.

Aubert, L.: Transperitoneal Cæsarean Section on the Lower Segment of the Uterus (L'opération césarienne transpéritonéale sur le segment inférieur). *Rev. franç. de gynéc. et d'obst.*, 1921, xvi, 129.

The author describes his technique for transperitoneal cæsarean section as follows:

The incision runs from the symphysis to one or two finger-breadths below the umbilicus. A transverse incision of the peritoneum 7 to 8 cm. long is made at the level of the vesico-uterine cul-de-sac and the peritoneum is pushed back toward the pubis so that the lower segment is denuded. A vertical incision in the lower segment is then made in the median line and the infant extracted.

After the uterine wound has been sutured the flap of peritoneum which was pushed down is brought up and sutured over the uterine wound. This step is shown in an illustration. Slight anteversion of the uterus results, but it is not enough to do any harm.

Four cases in which this operation was performed are described. The author believes that there is less danger of infection than in the classical cæsarean section. If infection does take place it will extend downward into the vesico-uterine space and produce a parametritis which is much less dangerous than an intraperitoneal infection and peritonitis. He believes this operation is safe even when there is some reason to suspect infection, as in cases of rupture of the membranes before operation and those in which frequent examinations have been made.

As the intestines are not approached so closely in this procedure there is less danger from that source. The hæmorrhage is not any greater than in the classical operation, and there is apparently no greater danger of rupture of the uterus in subsequent pregnancies. Any woman who has undergone a cæsarean section should be closely watched in subsequent pregnancies. If rupture takes place it is better for the uterine contents to be discharged extraperitoneally from the lower segment than intraperitoneally from the classical incision.

A. G. MORGAN, M.D.

LABOR AND ITS COMPLICATIONS

Garriga, B.: Spasmodic Rigidity of the Cervix Produced by Ergot, with Consecutive Retention of the Placenta in a Primipara (Rigidez espasmodica del cuello uterino producida por el cornezuelo de centeno, con retención consecutiva de la placenta en una primípara). *Arch. de ginec., obst. y pediat.*, 1921, xxiv, 65.

Fifty centigrams of ergot were administered to a primipara, 23 years of age, who was at term. This increased the pain and was followed by expulsion of the child. As the secundines failed to appear, a second dose was administered. The second dose produced a uterine spasm so intense that the administration of chloroform was necessary before manual detachment of the adherent placenta could be effected. Even though every precaution was taken, puerperal infection developed and lasted three weeks.

The author concludes that the possible effects of ergot on primiparæ render the use of forceps more desirable.

W. A. BRENNAN.

Goffe, J. R.: Laceration of the Cervix Uteri: What Does it Mean to the Patient, Obstetrician, and Gynecologist? *N. York State J. M.*, 1921, xxi, 129.

Every cervix torn in labor to a pathologic degree may constitute an entrance to infection causing subinvolution of the uterus, hypertrophy of the connective tissue, leucorrhœa, sterility, and possibly involvement of the tubes and ovaries. It should not be forgotten, moreover, that cervical laceration is the essential condition preceding cancer.

Goffe believes that although it runs counter to the teachings of the present-day obstetrician, every cervix should be drawn down to the vulva following delivery of the placenta so that the extent of any laceration may be carefully noted and repair may be effected if it is deemed necessary. The only contra-indication is exhaustion or collapse of the patient to a degree which would make the procedure hazardous.

If the obstetrician fails to perform repair of the cervix immediately following delivery, the next most favorable time is during the puerperium before the patient has returned to marital relations and before infection has occurred. Simple trachelorrhaphy is the proper procedure.

The question which confronts the gynecologist is not how to repair the original injury, but how to eradicate the primary infection without destroying the function of the cervix. Goffe advocates the plastic conical enucleation of the cervix described by Sturmdorf. The essentials of this procedure are complete enucleation of the entire endocervical mucosa with its infected glands from the external to the internal os (the entire muscular structure of the cervix being preserved) and accurate relining of the denuded cervical canal with a cylindrical cuff of vaginal mucous membrane.

R. T. LAVAKE, M.D.

Bruenner, K. E.: Cervicovaginal Fistulae After Delivery and Abortion (Ueber Mutterhals-Scheidenfisteln nach Geburten und Fehlgeburten). *Zentralbl. f. Gynaek.*, 1921, xlv, 113.

A 31-year-old primipara had a normal spontaneous delivery of normal duration, but a transverse tear of the cervix occurred which extended from the anterior vault of the vagina high up into its posterior vault so that the cervix was connected with the uterus by only a narrow bridge of tissue. The os admitted a finger. Following suture there was fever for a time but the patient recovered. The posterior vault of the vagina was much shortened and the anterior lip of the os protruded.

Such tears have been observed in spontaneous abortions as well as in spontaneous deliveries. In the former the cause is too great an ante flexion of the uterus which transmits the force of the pains chiefly to the posterior wall of the cervix, causing overdistension, especially in women with a long and rigid cervix and a rigid external os. The author believes that in delivery at term excessive ante flexion is impossible, but that at a certain stage of delivery the force of the contractions is directed chiefly against the posterior wall of the cervix. If at this time there is insufficient dilatation of the cervix and os, the posterior cervical wall must yield to the pressure of the head and, as in abortion, becomes ruptured. This may be caused by advanced age in primiparae, a certain defectiveness of the tissues of the posterior wall due to metritis, lack of elastic fibers, or cysts. Immediate suture is the best treatment. If the sutures do not hold, the torn part should be amputated and a plastic operation performed on the mouth of the uterus.

Perforation of the cervix in spontaneous abortion and spontaneous delivery may sometimes be of medicolegal significance. Twenty-seven cases occurring in abortion and seven occurring in delivery are reported from the literature.

HOCHHEIMER (Z).

Goldspohn, A.: The Repair of Partial and Complete Lacerations of the Perineum. *Surg., Gynec. & Obst.*, 1921, xxxii, 443.

The author states that it is admitted very generally that the former standard perineorrhaphies were little more than mere resections of mucous membrane

of variable shape and extent, and that they did not restore to function the levator ani muscle and its fasciae which are the chief bearing structures in the pelvic floor.

Accordingly, numerous efforts have been made to engage the levator, but most of them have been unsuccessful because the operators have evidently mistaken the so-called triangular ligament or urogenital trigone, a more superficially located and more prominently outstanding and resistant fascial structure, for the levator ani. The latter lies more laterally and further within the pelvis and extends slantingly backward and inward so that it meets the rectum at a point approximately 5 cm. from the normal perineal mucocutaneous juncture. This mistake is evident from their illustrations and from their technique as described or observed. In a nulliparous woman in whom these structures have never been distended or injured the levator in its fasciae can be felt laterally with the finger at the distance mentioned within the vagina and beyond the more resistant trigone.

To point out the mistake under discussion Edward Martin (Berlin) made a series of drawings from most exact and authentic perineal dissections of especially prepared pelvises under the supervision of Waldeyer. As these were published in an atlas which is limited practically to libraries, Goldspohn reproduces them in his article in order to bring a correct and clearer understanding of the anatomy to surgeons and gynecologists in general. These plates show the anatomy in detail. Also illustrated is the restoration of the pelvic floor by an entirely intrapelvic operation performed with a Ristine flap, either alone or in conjunction with repair of the sphincter ani and rectum in cases of complete tear.

PUERPERIUM AND ITS COMPLICATIONS

Bell, W. B.: The Prevention and Treatment of Puerperal Infections. *Brit. M. J.*, 1921, i, 693.

The author reviews the knowledge and methods of to-day and indicates changes which might be made in the prevention and treatment of puerperal infections.

The mortality has not decreased appreciably. Prophylactic measures which are possible are still neglected in some cases, and often unnecessary interference is practiced.

The question of interference is considered. The difficulties of labor are increased for the modern woman by athletics, excessive mental excitement, and the adverse circumstances under which women work in industrial plants. Many instances are noted of interference without good scientific indications. The use of forceps because of the demands on the time of the attending physician, the lack of proper attention to antisepsis and asepsis in obstetrical operations, and the substitution of vaginal examinations for rectal examinations are causes contributing to the high mortality rate. Natural defenses are prelabor leucocytosis and the acid vaginal secretion.

The portals of entry are the placental site and cervical and perineal tears. The author teaches his students to place the sutures in the perineum before the laceration occurs.

Mention is made of autoinfection, and a case of pneumococcal infection of the placental site causing death after a normal spontaneous delivery without vaginal examination is cited. The vagina may be infected with the streptococcus by intercourse during the later weeks of pregnancy. The possibility of autoinfection or lack of resistance is limited and should not be used as a shield for the obstetrician as the large majority of infections are carried into the wound by the attendant. Obstetrical operations are surgical operations and no makeshift technique should satisfy the operator.

Every care to preserve the acid secretion of the vagina should be made; consequently preliminary vaginal douches are contra-indicated. The large bowel should be emptied long before interference becomes necessary. Careful preparation of the vulvar area and care as to the scrub-up technique are of prime importance. The author raises the question as to whether interference should ever be attempted in unsuitable surroundings. Infection of the placental site is more common than the death rate appears to indicate as a large number of the patients recover.

A febrile condition (101 degrees F.) on the evening of the second day is a definite indication for immediate intervention. Bell recommends exploration of the uterine cavity and removal of any placental tissue with the gloved finger. He condemns the use of the sharp curette. Milton's fluid, a powerful and stable hypochlorous acid preparation, is employed for uterine irrigation. It is advisable to use a 1:10 solution for the first irrigation and a 1:30 solution for subsequent irrigations. Rapid improvement follows this treatment. Its benefits are principally abortive. If it is not effective, a double tube should be inserted in the uterus and irrigation should be frequently repeated.

Bell believes that localized abscesses in the ovaries, tubes, or uterus call for the removal of these structures.

Prompt ligation of the internal iliac and the ovarian veins, which are easily accessible, cuts off con-

siderable invasion of the blood in cases of septicaemia. The use of 0.5 c.cm. of pituitrin twice daily often aids in maintaining a proper blood pressure. Vaccines and anti-streptococcus sera should be used, but are not to be relied upon entirely.

Cellulitis usually follows infection of lacerations of the cervix and vagina. These prove fatal only when the pus is not evacuated at the proper time. As treatment for early cases of cellulitis Bell advises sterilization as far as possible by douches and drainage of the abscess cavity. When streptococcal infection of a laceration occurs a procedure much the same as that followed in uterine infection is indicated.

An honest recognition of puerperal infection and of the fact that it is almost always avoidable is urged. More attention should be paid to proper asepsis and rectal examinations. Forceps operations should never be performed except under surgical conditions.

All lacerations should be efficiently sutured and the natural defenses of the organism maintained.

W. N. ROWLEY, M.D.

Couinaud, P., and Clogne, R.: The Chemical Examination of the Blood in Cases of Puerperal Infection (Examen chimique du sang chez quelques infectées puerpérales). *Rev. franç. de gynéc. et d'obst.*, 1921, iii, 265.

In a number of cases of puerperal infection the authors determined the amount of urea and residual nitrogen in the blood and the amount of nitrogen and acetone in the urine. They describe the technique of the tests and report the results in eight cases.

They found the urea and nitrogen in the blood approximately normal in cases of normal puerperium. In puerperal infection they were increased, the increase being, in general, proportional to the severity of the infection. It had been expected that the amount of urea would be increased in the normal puerperium because of regression of the uterus.

The determinations made are of value in the prognosis. The authors believe that the cause of the phenomena may lie in poor function of the kidney or liver.

A. G. MORGAN, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Harrington, S. W.: The Effect on the Kidney of Various Surgical Procedures on the Blood Supply, Capsule, and on the Ureters. *Arch. Surg.*, 1921, ii, 547.

This experimental study of the kidney and ureter was undertaken on dogs to determine the effect produced on them by some of the common surgical procedures or by injuring them during operations on other organs. The experiments and results were divided into four series. Each surgical procedure was carried out with the strictest observance of aseptic technique identical with that used on man. The technique of each surgical procedure is discussed briefly in the discussion of the experiments.

The object of the first series of experiments was to determine the effect on the kidney and ureter of complete sudden occlusion of the ureter or of complete sudden occlusion of both the ureter and the collateral venous circulation. The experiments regarding the effect of occlusion of the ureter alone demonstrated that a hydronephrosis was produced in every instance, the degree depending on the duration of the obstruction. The hydronephrotic cavity was developed by dilatation of the pelvis and atrophy of the renal parenchyma. The atrophic changes were very uniform in distribution; the renal blood vessels were the last structures to be affected by the increased intrarenal pressure. The kidney was capable of secreting urine after thirty-six days of complete ureteral obstruction. The capsular veins were dilated in every experiment, the enlargement depending on the amount of hydronephrosis to which it was secondary.

When the collateral circulation was obstructed as well as one ureter the hydronephrosis developed more slowly and the sac was smaller than when only the ureter was obstructed. The atrophic changes took place in the same sequence as when the ureter alone was ligated. Pyonephrosis was more common when the collateral vessels were obstructed.

The second series of experiments was devised to study the effect of the occlusion of the various vascular radicals of the kidney. The studies of the ligation of the renal artery showed that, being an end artery, it was the only source of blood supply to the kidney; no collateral anastomoses were formed after its ligation. In some experiments decapsulation was done and the kidney wrapped in omentum, but no anastomoses sufficient to supply the renal parenchyma were formed. When one or more branches of the renal artery were ligated it was shown that there were no anastomoses between the various branches and that atrophy of the renal parenchyma supplied by any branch followed

the ligation of that branch. Ligation of the renal vein was followed by symmetrical atrophy of the kidneys. Although a partial venous collateral circulation was established, chiefly with the ovarian or spermatic veins, the suprarenal veins, and branches of the lumbar veins, it was not sufficient to assume the function of the renal veins. Rupture of the kidney may follow ligation of the renal vein, while ligation of one of the large branches of the renal vein produces no appreciable effect on the kidney.

The third series of experiments was made to show the effect of injury of the ureter on the ureter and kidney. Crushing the ureter with artery forceps caused degenerative changes which later resulted in scar formation. Dilatation of the ureter and pelvis above this crushing frequently occurred and in some instances progressed to a hydronephrosis and degeneration of the kidney without dilatation of the capsular veins. The ureter may be stripped of its surrounding tissues without permanent injury or deleterious effect on the kidney, provided its blood supply is preserved. Experiments to determine the best method of effecting ureteral anastomosis were made. End-to-end anastomosis was effected in 5 instances, cuff anastomoses in 13, and a uretero-ureterostomy in 4. The cuff method proved to be much superior to the other methods.

The effect of decapsulation of the kidney was studied in the fourth series of experiments. It was found that the kidney forms a well-marked new capsule in about seventeen days, the interstitial tissue of the cortex increases, and the newly formed capsule is more dense and fibrous and contains fewer blood vessels than the normal capsule.

G. S. FOULDS, M.B.

Battle, W. H. Permanent Drainage of the Only Kidney. *Lancet*, 1921, cc, 848.

The author reports the case of a girl, aged 23, who for five years had passed all the urine from her only kidney through a silver tube in the left loin. The patient's general condition was excellent, the skin not irritated, and the urine clear except at intervals when the patient suffered with a "feverish cold." There was no leakage about the tube. X-ray examination showed no phosphatic concretion. Cystoscopic examination revealed no ureteral opening on the right side and it was impossible to pass a catheter far along the left ureter, facts which confirmed the statement that there was only one kidney.

The necessity for drainage of the only kidney followed an operation in 1911 for double uterus with complete septum and retention of menstrual blood in the closed right half. This operation was not a success. A complete hysterectomy in 1914 resulted

in a vesicovaginal fistula. Two months later the patient returned complaining of pain and tenderness about the left kidney which had begun six weeks earlier. There was a rise of temperature, and colon bacilli were found in the urine. The renal pelvis, which was distended with purulent urine, was freely opened and a large rubber drainage tube placed in the pelvis. After two weeks no urine was passed by the urethra. The urine from the tube was clear, but pus still passed from the bladder. A silver tube, which was later substituted for the rubber tube, fits closely at a point corresponding to the lumbar fascia and is taken out and cleaned daily.

This case demonstrates the superiority of nephro-stasis when the ureter has been badly injured and it is impossible to re-establish the channel by any method of ureteroplasty. C. F. ANDREWS, M.D.

BLADDER, URETHRA, AND PENIS

Roberts, C.: A Method of Operation for the Treatment of Ectopia Vesicæ. *Lancet*, 1921, cc, 1125.

The treatment of exstrophy of the bladder consists of the transplantation of the ureters into the bowel. The method of transplantation employed by the author avoids the risk of peritoneal infection which occasionally follows leakage after the transperitoneal operation of Mandyl, Stiles, and Coffey. The risk of retraction of the ureters, which occurs occasionally after the extraperitoneal operation, is also avoided.

Operation should not be attempted until the child is at least 2 years old. Suitable urinary antiseptics are administered before the operation is undertaken. Small, No. 2 Black French catheters are fastened in the ureters, a disk of mucous membrane with a radius of 1 in. is incised about each ureter, and the ureters are dissected free for a distance of 2 in. The mucous membrane between the ureteral pouches is then incised transversely and the cut edges of the bladder wall are sutured to the seromuscular coat of the rectum, thus closing off the peritoneal cavity. The rectum is incised transversely, an opening about $1\frac{1}{2}$ in. in length is made, and the ureters are transplanted in the angles of the incision.

G. S. FOULDS, M.B.

Bumpus, H. C., Jr.: Submucous Ulcer of the Bladder of the Male. *J. Urol.*, 1921, v, 249.

Fifteen cases of submucous ulcer of the bladder (Hunner type) have been operated on in the Mayo Clinic since December 1, 1916. Two of these occurred in males.

The disease process involves the mucosa only slightly, but greatly involves the submucosal structures. Hence the term "submucous ulcer" seems to be the most applicable of the many suggested since Hunner's first article.

There is nothing to indicate that the female alone is affected, although no cases in which the condition affected a male have been described previously.

The age of occurrence (average 32 years) and pathologic features, such as prominent vessels, polymorphonuclear leucocytes in the vessel walls and paravesical tissues, diffuse submucous lymphocytic infiltration, and extravasation of red blood cells through the surrounding tissues, all indicate that infection is a cause. Moreover, since the perivascular changes, cellular infiltration, and oedema are most marked in the outer part of the bladder wall, and as the bladder mucosa itself may show no involvement, it is probable that the infection occurs by way of the blood stream.

Eight of the 15 patients whose cases are reviewed had peri-apical infections which were shown by dental roentgenograms. From the teeth of several of them bacteria were isolated which, on being introduced into laboratory animals, elected the bladder as their site of location and reproduced typical lesions.

The fact that there are few changes in the urine suggestive of the disease has prevented early diagnosis. Microscopic examination of the urine was negative in 10 cases in the series, including those of the 2 males, but all of the patients gave a history of intermittent attacks of gross hæmaturia due to the fact that over-distention and trauma cause the ulcer to bleed. During cystoscopy this tendency to bleed is prominent, and with the pain and frequency, which are severe both day and night, is pathognomonic.

The average duration of symptoms was ten years. Of 8 patients operated on more than one year previously 4 reported a complete cure and 4 were unimproved. In the 4 cases not benefited there may have been a recurrence due to foci of infection. Therefore such foci should always be removed.

The male patients were 25 and 30 years of age. Both gave histories of previous urinary infections several years before, one of perinephritic abscess and the other of bladder ulcers from which he had recovered. In both cases typical oedematous, reddened areas were found in the dome of the bladder. Resection was carried out and the pathologic findings confirmed the clinical diagnosis of submucous ulcer of the Hunner type.

LINWOOD D. KEYSER, M.D.

Reifferscheid, K.: The Operative Treatment of Incontinence of Urine in Epispadias by the Goebell-Stoeckel Operation (Die operative Heilung der Incontinentia urinæ bei Epispadie durch die Goebell-Stoeckelsche Operation). *Zentralbl. f. Gynaek.*, 1921, xlv, 97.

A 23-year-old girl had suffered from childhood from incontinence of urine, the cause of which was found to be epispadias and split pelvis. The very short urethra would admit the little finger. The anterior wall passed directly into the cicatrized skin. There was no trace of sphincter action.

The patient was operated upon by the Goebell-Stoeckel method. A flap of fascia 4 to 5 cm. broad and 10 to 12 cm. long was made with the underlying pyramidalis muscle forming a part of it. The

anterior wall of the bladder and the neck of the bladder being then laid bare almost to the vaginal wall, the flap of fascia which had been split in the middle was fastened to two small tampons which were laid in the groove in the abdominal wound. By means of these tampons the fascia flaps were drawn downward after the neck of the bladder had been laid bare from below through a median incision in the anterior wall of the vagina. The flaps of fascia were crossed under the neck of the bladder and their ends sutured to the pubic part of the levator. The author believes this procedure is correct as the muscular contractions of the levator strengthen the sphincter action.

The result of the operation was very good. Reifferscheid thinks that it does not make much difference whether the pyramidalis muscle or only a layer of the rectus muscle remains a part of the fascia flap, as even though there is no innervation of the transplanted muscle, the compression of the neck of the bladder is sufficient to insure continence and voluntary urination.

HOCHHEIMER (Z).

Melchior, E.: A New Method for the Operative Treatment of Complete Epispadias (Eine neue Methode zur operativen Behandlung der Epispadia totalis). *Zentralbl. f. Chir.*, 1921, xlviii, 220.

The chief difficulty in operations for epispadias is incontinence of urine. As a rule an attempt is made to overcome this condition by diverting the urine into the intestine. In a case of complete epispadias which had previously been operated on for ectopia of the bladder Melchior sutured the rudimentary stump of the penis into a fold of the scrotum and made a tube which he fixed above the opening into the bladder. After several supplementary operations he succeeded in forming a new urethra about 5 cm. long which could be kept closed with a forceps.

The patient, who had suffered a great deal from incontinence, was well satisfied with the operation, but it is by no means an ideal one as it does not secure active continence. It is to be recommended, however, in extreme cases of complete epispadias.

KNOKE (Z).

Corbus, B. C.: Presentation of a Case of Prickle-Cell Carcinoma of the Penis Treated by Diathermy and Radium. *Am. J. Clin. Med.*, 1921, xxviii, 226.

Prickle-cell carcinoma of the penis usually begins on the glans or inner leaf of the foreskin as a result of a chronic balanoposthitis with retained smegma and decomposing urine. As a rule, it metastasizes to the regional lymphatics although this may not take place for years; from this point metastases develop in the lumbar glands along the vertebræ and here the condition may remain dormant for a long time.

When a prickle-cell cancer is excised and cut through, it is noted that the surface is rough, that the infiltration is deep, and that the cancerous

alveoli radiate downward in the form of white lines about the size of a very fine thread. Microscopically, the stained sections show the cancerous alveoli to be large and in whorl formation. The individual cells also are large and stain intensely with acid dyes.

The diagnosis may be made usually by a process of elimination. According to the best authorities, a section of the growth should never be removed for diagnosis by simple excision as this favors the dissemination of the process. With an early diagnosis and immediate and proper treatment the prognosis is excellent. When the diagnosis is made late the condition is fatal even though careful treatment is given.

The author states that surgical treatment has been rather discouraging. In order to avoid cutting procedures many methods have been advocated, chief of which are cauterization with the hot iron, electrical desiccation or coagulation, and the use of ferments or enzymes. The method which promises to be most successful is massive electrical coagulation by means of diathermy.

The author's case, presented in detail, represents an advanced case in which the use of diathermy followed by roentgen and radium treatments resulted in marked improvement. Corbus states that while nothing spectacular could be expected when the condition had remained undiagnosed for four years, it was interesting to see how easily such an enormous fungating mass could be removed with diathermy and replaced by healthy granulation tissue. Following the diligent application of radium all that remained of the cancer tissue and the inguinal metastases greatly improved, but unfortunately the deep common iliac vessels were already involved.

ADOLPH HARTUNG, M.D.

GENITAL ORGANS

Rohleder: The Implantation of Testicles in Prostatism (Hodeneinpflanzung bei Prostatismus). *Deutsche med. Wchnschr.*, 1921, xlvii, 185.

In an earlier work (*Deutsche med. Wchnschr.*, 1920, No. 3) Rohleder reports the therapeutic results of the use of preparations of testicle in hypertrophy and atrophy of the prostate. Because of the interaction of the internal secretions of the testicle and prostate, organotherapeutic preparations of testicle may have a definitely favorable effect on the changes in the prostate due to age, but this effect is not always exerted and is not permanent.

In Rohleder's opinion this action is only partial because the testicle preparations have merely a reducing action on the gland tissue of the prostate, and hypertrophy of the prostate is to be regarded an over-compensation in insufficiency of the internal secretion of the testicle. A permanent effect can be expected only if the body is provided with a permanent supply of testicular hormones. This may be obtained by transplanting human testicles freshly extirpated from cases of cryptorchidism.

In cases of impotence and castration transplantation of testicles restores the capacity for erection.

In prostatism there is probably a disturbance of the normal balance between the hormones of the interstitial tissue of the testicle and the prostate hormone. Rohleder believes that implantation of testicles is indicated in cases in which extract of testicle has a temporary effect. He has treated in this way only patients in the first and second stages of the condition. The testicles were implanted intramuscularly.

T. NAEGELI (Z).

MISCELLANEOUS

Macalpine, J. B.: Symptomless Hæmaturia: A Plea for Early Investigation. *Brit. M. J.*, 1921, ii, 631.

Hæmaturia unaccompanied by any other sign or symptom is frequently disregarded by the physician in spite of the fact that it is often the only sign of the presence of a neoplasm of the urinary tract.

Most diseases of the urinary tract give rise to hæmorrhage; in some, this sign is characteristic, while in others it is exceptional. In cases of papilloma of the bladder and cases of hypernephroma the bleeding frequently occurs very early in the

history of the tumor and at the time when the growth is non-malignant and amenable to treatment with a prospect of complete cure. The hæmorrhage is often single and of short duration. It is imperative to determine its source; but frequently this is possible only while the bleeding is in progress. The pathologic process may be determined later.

In urging early investigation Macalpine quotes several other observers. Walther had 74 cases of hæmaturia with and without other symptoms; 50 per cent of these showed growths and 72 per cent of the growths were malignant. In 709 cases of renal growths cited by Hinman (the published work of eight surgeons) hæmaturia was present in 42 per cent as an initial symptom, while in only 6.6 per cent was it unaccompanied by pain or tumor at the time of operation. The opportunity for early diagnosis in many of these cases had evidently been lost. Eighty-three cases of hypernephroma cited by Braasch were of the same type. In 77 per cent of these hæmaturia had been present for more than a year before other symptoms led to treatment.

The author cites also 4 cases in his own practice in which hæmaturia was the symptom of diseases other than new growth. These were cases of scurvy, rickets, early tubercle, "essential hæmaturia," and stone in the pelvic outlet.

J. W. Ross, M.D.

SURGERY OF THE EYE AND EAR

EYE

Loeb, C.: Why We Accommodate. *Am. J. Ophth.*, 1921, iv, 265.

The theory which the author offers to explain the causation of accommodation is as follows:

1. The act of accommodation is caused by rays of light from any point on the surface of an object passing through the perceptive elements of the retina while still converging, or passing in an oblique direction from the periphery toward the center.

2. The amount of accommodative effort is dependent directly upon the obliqueness with which the converging rays reach or pass through the retinal elements.

3. Although the mechanism of accommodation is of phylogenetic origin, accommodation itself is an acquired act due to the fact that the individual learns from his experiences that certain sensations due to converging obliqueness of rays mean that an object lies closer to his eye than their far point and that certain muscular efforts are necessary to see it distinctly. This takes place so early in life that at the age of a few months it has become subconscious or involuntary.

Corollaries to this theory are given as follows:

1. The act of accommodation should always be present in a hyperopic eye.

2. The act of accommodation should be present in an emmetropic eye when the object looked at is at infinity (or its equivalent, 6 meters), but especially when it is at a finite distance.

3. The act of accommodation should be present in a myopic eye whenever the object looked at is closer than the far point of the eye.

4. The act of accommodation should be present in any eye when the rays reach it after passing through a concave lens sufficiently strong to alter their course so that they are converging when they reach the retina.

5. The act of accommodation should be absent in any eye when the rays reach it after passing through a convex lens sufficiently strong to alter their course so that they are diverging when they reach the retina.

6. The act of accommodation should be present in an astigmatic eye when either or both of its principal meridians refract the rays so that they converge when they approach the retina. The pain so frequently present in astigmatism is probably due to a difference in the amount and character of the obliqueness of the rays passing through the principal meridians, which results in differences in the amount of stimulus toward accommodation or even in a stimulus toward accommodation and a simultaneous stimulus toward relaxation of the

accommodation. This warring of stimuli or their effects causes direct pain in the eye, referred pain in the head, or reflex symptoms such as dizziness, malaise, or disease such as blepharitis.

7. A myopic eye with active accommodation should accept a stronger glass than its real refraction because the tendency of a concave lens is to make the rays divergent. As soon as the focus is made to recede to the retina there is evoked an effort of accommodation due to the converging obliqueness of the rays which throws the focus in front of the retina and allows the acceptance of a stronger concave glass.

8. A hyperopic eye with active accommodation can never accept a stronger glass than its real refraction, and usually will accept a weaker one, because the tendency of a convex lens is to make the rays converging. The tendency of the accommodation is also to make the rays converging. When the sum of the two brings the focus onto the retina there will be clear vision. Additional strengths of convex lenses will tend to bring the focus in front of the retina and vision will be obscured until the divergence of the rays after they pass the focus causes the accommodation to relax and allows the focus to recede to the retina. As soon as the accommodation is completely relaxed, additional strengths of convex lenses will cause the rays to diverge obliquely and vision will be obscured. O. M. Rorr, M.D.

James, J. H.: Ocular Imbalance. *Minnesota Med.*, 1921, iv, 237.

In persons with sluggish nerve sensibility heterophorias do not seem to have any particularly disturbing influence, while in those of greater sensibility they cause most distressing symptoms including blurring of vision and headaches of varied types such as that in the back of the neck known as the "check-rein" feeling.

The varying conditions contributing to eye strain are so complicated and numerous that it is impossible to give relief and comfort with any degree of certainty by means of glasses alone.

It should be our aim to adjust corrections so that the intrinsic and extrinsic muscles can work together in harmony. In order to do this the author has sometimes found it necessary to prescribe glasses the opposite of those called for by the refractive error.

When the anomalies are due to the faulty attachment of muscles operation is often justified but should be done only when other methods fail. When they are due to inherent or acquired weakness, improper development, or paresis, gymnastics are indicated. When they are due to overuse, rest must be the remedy.

Muscle exercises must be supervised as the prisms must be correctly placed, regularity, persistency and rapidity are essential for success, and patients almost invariably fail to follow instructions.

The author recommends the Hazen kratometer as the best instrument for muscle exercising as it does away with the uncertainty and inconvenience of other prism practice. S. S. HOWE, M.D.

Marks, E. O.: A Recording Scotometer. *Brit. J. Ophth.*, 1921, v, 170.

This instrument, which is really a recording attachment for a Bjerrum screen, has been designed to obviate the laboriousness of noting and later plotting the findings in visual field examination.

The mechanical principle adopted is that of the reducing instrument known as the pantograph. A standard, which holds a horizontal arm supporting a Bjerrum curtain, has attached to it the pantograph and a chart on which the findings of the long arm of the instrument which holds the test object are recorded by a pencil on the lesser of the two parts of the pantograph.

S. S. HOWE, M.D.

Roll, G. W.: A Foreign Body Retained in the Eye for Many Years. *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Sect. Ophth., 25.

A metallic foreign body penetrated the eye of an arsenal worker eighteen years ago and when seen a few weeks after the accident the fundus presented up and out from the macula a greenish white oval spot which evidently was the encystment of the particle. Vision was 6/6; media clear; no corneal nebulæ.

Vision is now 6/18. There is no macular change and no siderosis. The only ophthalmoscopic features are an area of atrophy below the foreign body and a slight deposit of pigment. There is a limited loss of visual field to the nasal side.

A case is cited also in which a foreign body remained in an eye for twenty-nine years without causing trouble. S. S. HOWE, M.D.

Batten, R. D.: The Clinical Significance of Deep Tension of the Eye in Its Bearing on Glaucoma, As Illustrated by Rubber Balloons. *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Sect. Ophth., 29.

An experiment with rubber bulbs is described which shows that the terms "tension" and "pressure" as used in relation to the eye are descriptive of different states.

Two India-rubber balloons of equal size and communicating with each other and with a manometer are inflated. Up to a certain point expansion and tension remain equal. The elasticity of one bulb then giving way, this bulb expands while the other slightly contracts. At the same time the pressure in the manometer falls to a point at which it remains stationary. The larger balloon feels harder because the membrane is thin and stretched and

pressure gives a sense of resistance called deep tension. The smaller balloon feels softer because its walls are thicker and not taut and its true tension is slightly less than that of the larger balloon.

Deep tension in the eye is represented by the extent to which an eye dimples to a given pressure. This tension varies. In some eyes the superficial tension is so soon passed that it may be confused with deep tension.

In myopia expansion of the eye may take place without a rise of pressure. This may be present also in eyes with progressive glaucomatous cups in which no tension can be detected. S. S. HOWE, M.D.

Butler, T. H.: The Trephine in Chronic Glaucoma. *Arch. Ophth.*, 1921, i, 1.

Analysis of the author's cases of chronic glaucoma treated by iridectomy showed that only 43 per cent were permanently relieved. Many of the eyes were subsequently trephined with varying success although trephination after iridectomy was found to be neither so easy nor so successful as primary trephination.

In cases of sclerotomy successful results were obtained in 64 per cent. Holth's punch operation was most effective in reducing tension but nearly all cases of late infection followed this procedure.

As the author found the 1½ mm. trephine too small, he devised a 2 mm. trephine. With the latter he has been able to obtain a good result in 77 per cent of cases.

When trephining with the 2 mm. instrument is done early in glaucoma simplex the chances for a long intermission or a complete cure of the disease are excellent. The indications are raised tension with signs of impairment of function.

Butler doubts the permanent value of miotics in eyes without shallow anterior chambers and the validity of the opinion that many cases would have progressed as well without local treatment and that miotics should be reserved for cases in which, because of the patient's age, nervous instability, or other circumstances operation is definitely contra-indicated.

He does not accept the view that when contraction of the visual field menaces the fixation point any operation is apt to cause loss of central vision. In his opinion the greater the contraction of the fields the more urgent the need for immediate operation. S. S. HOWE, M.D.

Burch, F. E.: Ocular Tuberculosis. *Minnesota Med.*, 1921, iv, 198.

We are able to recognize ocular tuberculosis by certain characteristic clinical appearances and the patient's age and personal and family history. The chief aid, however, is the tuberculin reaction.

Eye tuberculosis occurs commonly in patients who seem to be in fair general health. The pathologic histology is always atypical, tubercle bacilli are demonstrated with great difficulty, and diagnosis by inoculation is rarely possible.

Most cases of episcleritis, scleritis, and sclerosing keratitis, certain non-ulcerative types of keratitis, about 10 per cent of cases of anterior uveitis and iritis, and a few types of exudative chorioiditis and chorioido-retinitis are found to be tuberculous.

Whether so-called phlyctenular keratitis and conjunctivitis may be classified as tuberculous is still unsettled, but physical evidences of tuberculosis are found in the majority of the patients. While these conditions generally become cured without the use of tuberculin, Derby found that all cases progressed better when tuberculin was employed.

Seven cases of tuberculosis of the eye are reported in detail. Emphasis is placed on the use of tuberculin in the diagnosis and treatment but attention is called to the possibility that vision may be made worse by the reaction, especially in retinal lesions. The use of tuberculin in chronic cases is recommended.

The majority of cases are progressive and of the chronic type. The results of tuberculin therapy, especially in lesions of the anterior quadrant of the globe, are distinctly good. S. S. HOWE, M.D.

Danis, M.: Congenital Anomalies of the Fundus of the Eye. *Am. J. Ophthalm.*, 1921, iv, 233.

This article reports the ophthalmoscopic appearances found in three cases. In one there was a persistent hyaloid artery and visible canal of Cloquet. In the others there was a membranous and more or less opaque structure in front of the disc. This was regarded in one case as an epipapillary membrane and in the other as an anomalous prolongation of the lamina cribrosa. O. M. ROTT, M.D.

EAR

Rott, O. M.: Concerning the Question of Jugular Ligation in Sinus Thrombosis. *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 820.

With regard to jugular ligation in sinus thrombosis there are many variations of opinion between the ultra-conservative view that it should be done only after the appearance of metastasis, and the ultra-radical view that it is indicated by the mere presence of sinus thrombosis.

Rott classifies these various views as follows: (1) those favoring ligation in all cases, (2) those opposed to it in all cases, (3) those favoring it only in the absence of free bleeding from the jugular end of the sinus, (4) those favoring it only when rigors and fever continue after the removal of the thrombus, and (5) those favoring it only after the development of metastases.

After critically reviewing, in the light of present knowledge, the principles upon which these various views are based he offers the following indications for jugular ligation in sinus thrombosis:

1. In the presence of metastases or when the vein presents physical evidences of thrombosis.

2. When free bleeding fails to occur from the jugular end, even though there are no metastases or physical evidences of thrombosis in the vein.

3. When rigors and fever continue or re-appear after the sinus operation even though free bleeding has occurred from the jugular end.

The term "ligation" as used in this article refers to any jugular operative interference, simple ligation or ligation with resection.

Vernieuwe: Anomalies of the Sinuses of the Dura Mater and Their Clinical Significance in Otolaryngology (Les anomalies des sinus de la dura-mère; leur signification clinique en otologie). *Rev. de laryngol.*, 1921, xlii, 208, 239.

The most frequent anomalies of the sinuses of the dura mater are discussed and the arrangement of the sinuses is shown by illustrations. A typical torcular herophili as described in textbooks was found in only 3 of 60 cases examined.

In 67 per cent of the cases the superior longitudinal sinus emptied into the right transverse sinus and the straight sinus continued into the left transverse sinus. In these cases the right transverse sinus was larger than the left. In 6 per cent of the cases the superior longitudinal sinus emptied into the left transverse sinus which was then the larger, and the straight sinus emptied into the less well-developed right transverse sinus.

In some cases there was a connection between the veins of the middle ear and those of the meninges and occasionally with those of the temporosphenoidal lobe. Through the meningeal veins above the middle ear a communication with the veins of the middle and posterior cerebral fossa was found. Therefore infection may extend from the middle ear to the meninges in the absence of a connection which is visible macroscopically. Such extension is particularly apt to occur in children.

The typical syndromes of thrombosis of the different sinuses are described. These are apt to be obscured by thrombosis of anomalous sinuses. Three cases are described, one of an anomalous sinus emptying into the lateral sinus, one of a petrosquamous sinus emptying into the cavernous sinus, and one in which there was a congenital fissure of the ear, and the superior longitudinal sinus emptied into the right transverse sinus near the junction of the vertical and horizontal parts, a little above the point where the mastoid emissary vein empties. In the third case there may have been some connection between the two anomalies in embryological development.

The article is supplemented with a bibliography of 78 titles. A. G. MORGAN, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Maselli, D.: A Case of Primary Syphiloma of the Palatine Tonsil (Sopra un caso di sifiloma iniziale della tonsilla palatina). *Policlin.*, Roma, 1921, xxviii, sez. prat., 404.

Mucous plaques indicating secondary syphilis are not unusual in the tonsils, but primary syphiloma is rare and therefore apt to be overlooked. The author reports the case of a man 25 years of age who treated himself for a few days for "sore throat," but was finally obliged to seek medical aid because of pain, difficulty in swallowing, and swelling of the cervical glands.

Only one tonsil was swollen and inflamed. About ten days after the beginning of the condition an ulcer with a hard base and margins developed. This at first caused only slight local and general disturbance, but after about five or six days was complicated by lateral cervical adenitis. The signs indicated either Vincent's angina or syphilis. The bacteriologist reported, "Streptococci and staphylococci; a few fusiform bacilli and spirilli; diagnosis, Vincent's angina." The author, still not satisfied, gave an injection of novarsenobenzol. The next day there was a typical Herxheimer reaction, the skin being covered with a syphilitic rash.

Maselli emphasizes the importance of making a Wassermann test in all cases of ulcer of the tonsil when there is the slightest suspicion of syphilis, and of giving treatment for syphilis until all doubt is dispelled. He advises mercury treatment rather than the use of novarsenobenzol.

AUDREY G. MORGAN, M.D.

Macleod, A. L.: Reports of Two Cases of Fatal Tonsillectomy. *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Sect. Laryngol., 31.

Macleod reports two cases of death following tonsillectomy. The first was that of a girl 10 years of age who was operated upon under ethyl chloride anaesthesia. At the end of seven hours she vomited bright blood. This vomiting continued for one hour and a half until ether was administered, the pillars were stitched, and a plug was inserted into the nasopharynx. Nine hours later, when she was apparently improving, death occurred suddenly. There was no autopsy and on the death certificate the cause was given as pulmonary embolism.

In the second case, that of a girl 6 years of age, hæmorrhage occurred two hours after the operation. One-half hour later a second anaesthetic was given, the pillars were stitched, and a postnasal plug was inserted. Without recovering consciousness the patient died suddenly four hours later. Death was attributed to hæmorrhage and shock.

According to Stuart-Low it is much wiser not to give a second anaesthetic in such cases of hæmorrhage as it raises the blood pressure and keeps up the bleeding. A clot should be thoroughly removed and the bleeding point sought for. Concerning this procedure, however, opinions differ. Franklin believes that a fully organized clot should not be disturbed. If it were not organized, continuous oozing from the deep surface of the clot would necessitate its removal.

O. M. ROTT, M.D.

Jackson, C.: High Tracheotomy and Other Errors, the Chief Causes of Chronic Laryngeal Stenosis. *Surg., Gynec. & Obst.*, 1921, xxxii, 392.

The most frequent cause of chronic laryngeal stenosis is high tracheotomy.

While in a given case no one has any right to say that the operation which saved that patient's life was unjustifiable, yet, equally rapid methods being available, high tracheotomy should not be taught.

The classic distinction between a high and low tracheotomy with reference to the isthmus of the thyroid gland should be abandoned. The vitally important decision as to where the trachea should be incised should not depend upon the negligible isthmus. Only one tracheotomy should be taught and that should be a low one.

The trachea should always be incised lower than the first ring except in those rare cases in which laryngoptosis renders this impossible without entering the anterior mediastinum.

The cricoid cartilage should never be cut unless laryngoptosis places all the rings of the trachea below the upper border of the manubrium, when entering the mediastinum would be necessary if the rule were followed.

The tracheotomic causes contributing to chronic laryngeal stenosis are:

1. High tracheotomy.
2. Hasty operation.
3. Attempts to induce general anaesthesia.
4. Cutting of the cricoid cartilage.
5. Hacking the trachea by making several incisions instead of one.
6. Denudation of the tracheal cartilages of perichondrium with resultant necrosis.
7. Suturing of the wound.
8. Prolonged wearing of a cannula of improper size, shape, or material, such as rubber or aluminum, or a cannula with a fenestra or without a pilot.
9. Neglect of proper after-care.

If in an emergency a high incision of the trachea is necessary, a cannula should not be worn in it. As soon as breathing has been resumed a low incision should be made and the cannula inserted therein.

The fundamental cause of the high incidence of chronic laryngeal stenosis lies in the faulty teaching of the surgical textbooks. Eminent surgeons would not do a tracheotomy through the larynx to avoid the isthmus of the thyroid gland or because of haste, but such surgeons are not always at hand when an emergency tracheotomy is necessary. These operations are usually postponed until respiration has ceased. If respiration has not already stopped, the practitioner promptly stops it by attempting to give a general anæsthetic. O. M. Rorr, M.D.

MOUTH

Sistrunk, W. E.: The Results of Surgical Treatment of Epithelioma of the Lip. *Ann. Surg.*, 1921, lxxiii, 521.

The author made this study to determine the results of operation for cancer of the lip after a lapse of from five to eight years. The results in this group of cases differ somewhat from those previously reported by Judd and Beckman.

A great difference is to be expected between the results in cases in which the glands are involved at the time of operation and those in cases in which operation is performed before glandular involvement can be demonstrated. The best results were obtained when the glands that drain the lip were removed as a prophylactic measure.

The lymphatic drainage from the lower lip passes through the submental lymphatics which drain the central portion of the lower lip and the submaxillary lymphatics which drain the remainder of the lip and the anterior portion of the cheek. On account of the free lymphatic anastomosis it is necessary to remove the glands on each side.

In small growths the glands should be removed first, and the growth on the lip immediately afterward. If the growth is extensive and a large portion of the lip must be excised, it is best to remove the glands first and the growth about three or four days later. The growth may be removed first, but occasionally infection delays removal of the glands.

The technique employed in removing the submental and submaxillary glands is as follows:

The incision, parallel to the lower jaw about midway between the upper portion of the thyroid cartilage and the symphysis of the jaw, extends from the inner border of the sternomastoid on one side to a similar point on the opposite side. The skin and platysma muscle are reflected upward as high as the jaw bone, and all of the glands and fascia of the submental region are removed. The glands, fascia, and fat, including the submaxillary and salivary glands, are removed from the submaxillary region. The ducts of the salivary glands are cut off just underneath the mylohyoid muscle, and the facial arteries and veins are cut off at the level of the digastric muscle and again at the point where they cross the lower jaw bone.

It is necessary to guard against injury to the lingual branch of the fifth nerve, to the hypoglossal

nerve, and to the inframandibular branch of the seventh nerve. The hyoglossus muscle forms the base of the submaxillary triangle. All the fat down to the muscle should be removed.

If the glands on either side of the neck are involved at the time of operation, all the glands draining that side of the neck should be removed by a block dissection. The glands and fascia from all the triangles are removed as high as the styloid process. The dissection extends down to the deep muscles of the neck, the glands and fascia lying along the carotid artery and the jugular vein being removed. The phrenic nerve, brachial plexus, common and internal carotid arteries, and the hypoglossal, vagus, and sympathetic nerves should be avoided. The omohyoid and sternomastoid muscles are removed and the spinal accessory nerve sacrificed. If the internal jugular vein is involved on one side of the neck, it may be removed.

In reviewing the histories of the patients, only those who had primary operations at the Mayo Clinic during the years 1912, 1913, and 1914 were considered. After dropping from the series the cases of recurrence, incomplete operation, and those in which no data were obtained after the operation, 136 cases remained. These the author classifies in three groups:

Group 1 comprises 98 cases in which a primary complete operation was performed when the glands were not involved; that is, a local excision of the growth with the removal of the glands draining the lower lip. Fourteen of these patients are dead, 5 from diseases other than cancer. Three letters were returned marked "deceased" without further information. Six patients died of recurrence. Excluding the 5 cases of death from disease other than cancer, 93 patients remain and there were 9 deaths from known recurrences; consequently 90.3 per cent are alive from five to eight years after the operation.

Group 2 comprises 11 cases in which the glands were involved at the time of operation. In 6 cases a block dissection was done; 5 of these patients are dead, and 1 is alive five years and three months after the operation. In the other 5 cases, on account of the patient's age or physical state, block dissections were not done, only the involved group of glands being removed. Four of these patients are dead and 1 is alive five years and eight months after the operation. Of the 11 patients, only 2 (18.1 per cent) are alive five to eight years after the operation.

Group 3 comprises 27 cases in which, usually on account of the patient's age or physical condition, the operation was restricted to excision of the growth only. Three patients died from disease other than cancer of the lip. After deducting these 3 cases, 24 remain, among which there were 5 deaths and 19 cures (79.2 per cent) five to eight years after operation.

The percentage of cures following operation was lower among the patients with glandular involvement than among those without such involvement.

The percentage of five-year to eight-year cures when the glands were involved was almost identical with that obtained in cases of cancer of the breast in which the glands were involved. The percentage of local recurrences after operation seems too large. This probably could be decreased to a certain extent by wide removal of the growth and the use of radium after operation. Rapidly growing epitheliomata are best removed with the actual cautery without a plastic operation at the time.

Treatment of the growth by means of radium and the X-ray, without removal of the glands, does not seem a radical method. Radium often destroys the growth but such a procedure is almost identical with the methods in which the growth is removed with pastes or by local excision. Although there may be no local recurrence following the latter procedures, in about 20 to 30 per cent of the cases metastasis occurs later in the submaxillary and submental glands.

FRENCH K. HANSEL, M.D.

Jones, C.: Salivary Calculus in an Acromegalic.
Ann. Surg., 1921, lxxiii, 527.

The author reports the case of a woman, 56 years of age, who had a tumor under the right jaw. The patient, an acromegalic of marked degree, had first noticed a hard painful swelling beneath the angle of the right jaw two or three years before her admission to the hospital. Two months previously this swelling became suddenly enlarged, inflamed, and very tender. After the application of hot poultices the condition subsided. At the time of the patient's admission to the hospital a hard mass about the size of a walnut was found just below the angle of the right lower jaw, to which it was apparently attached, and though it was slightly mobile the mass suggested a skeletal exostosis associated with the acromegaly.

X-ray examination, however, revealed an opaque, probably calcified body which was not connected

with the jaw. The shadow measured 24 by 32 mm. The entire lesion was removed under local anæsthesia. The pathologic examination showed an indurated submaxillary gland containing within a cavity lined with a definite membrane an irregular yellow mass of calcareous substance. This cavity communicated directly with Wharton's duct, and the calculus could be readily felt with a probe passed down the lumen of the duct. Its weight was 9.4 gm. On microscopic examination the surrounding tissues showed a chronic inflammatory process with increased fibrous tissue.

Salivary calculi are formed from the inorganic salts in solution in the normal saliva. Under abnormal conditions these are usually deposited on the teeth as tartar, but occasionally in the salivary ducts or acini as calculi. The calculi may have bacteria, epithelial debris, or a foreign body as nuclei. The inorganic salts concerned are the carbonates and phosphates of lime, potash, and magnesium. Bacterial action or the lodgment of a foreign body sets up an inflammatory process around the orifice of a duct or acinus which causes blocking, constriction, or roughening, and the decomposition of the saliva with consequent deposition of the salts. Calculus formation gradually results, the final stage being a stone which later may be ejected if it is not of large size. Of 37 stones, Czygen found 22 in Wharton's duct, 4 in the submaxillary gland, 5 in Stenson's duct, 1 in the parotid gland, 4 in the sublingual duct, and 1 in Bartholini's duct.

Complications of salivary calculi, if untreated, may be serious. Abscess formation is the most common. Fistula may result, and necrosis of the jaw may follow a large abscess. Occasionally small stones may be removed from within the mouth but as a rule an external incision is necessary. In the diagnosis sialolithiasis must be distinguished from root abscess.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

Nose

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Mouth

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INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1921

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Braun: The Treatment of Wounds Without Bandaging in Peace-Time Surgery (Die verbandlose Wundbehandlung in der Friedenschirurgie). *Deutsche med. Wchnschr.*, 1921, xlvii, 466.

The wound remains as a rule without preliminary bandaging. A shield of wire netting or of hoops is applied and the secretions of the wound are absorbed with cellulose. The exposed wound is treated by the application of loose gauze allowing free access of air or is kept moist in a damp chamber made by placing wet compresses on or beside it and covering the wire protection with compresses which are moistened anew from time to time. Also other methods, such as the use of salves and the air-tight treatment of Brie, may be used. The indications for the treatment of the various types of wounds are given as follows:

1. Aseptic operative wound closed by suture. Seal with strips of gauze allowing penetration of air; perhaps gutta-percha paper is even better.

2. Fresh peace-time injuries without visible signs of infection. Treat in the usual manner, giving particular care to hæmostasis. If necessary, provide drainage. The use of tampons should be avoided as much as possible. Apply loose gauze. If tampons are necessary they may remain in place from one to three weeks, but if infection develops they must be removed immediately and not replaced. Treat infection by the damp-chamber method. Long-continued open-air treatment delays the regeneration of tissues, the repair of the defect, and epithelialization; hence additional treatment by the damp method, by salves, or dry treatment with exclusion of air is necessary.

3. Soiled infected wounds. The damp chamber or continuous bath is indicated. Temporary dry treatment is necessitated only by the presence of anaerobes or extensive gangrene. As the continuous bath hinders regeneration of tissue, it must be discontinued when the infection is overcome.

4. Phlegmons. Incise according to the ordinary surgical principles and effect careful hæmostasis. Do not use tampons. Treat by the damp-chamber method.

5. Suppurating wounds. In acute osteomyelitis the abscesses should be incised and drained. The use of tampons is contra-indicated. The temporary application of a bandage is necessary only when there is hæmorrhage. The wound should be given continued dry treatment under loose gauze until fixation is no longer necessary. After necrotomy the cavity should be filled with catgut, a drain should be inserted, and the wound sutured. Dry treatment with loose gauze should then be given. When the defect is large the dry treatment should be discontinued as soon as possible and the wound sealed with gutta-percha in such a manner that secretions may escape.

6. Granulating wounds. Give dry-air treatment under loose gauze when there are exuberant, offensive granulations. This treatment must be discontinued as soon as the granulations become healthy and their abnormal development stops. The procedure is contra-indicated when bleeding or coaptation of parts demands compression and when the method cannot be applied without causing the patient too great discomfort.

WORTMANN (Z).

Kanavel, A. B.: Plastic Procedures for the Obliteration of Cavities with Non-Collapsible Walls. *Surg., Gynec. & Obst.*, 1921, xxxii, 453.

When it is possible to secure collapse of the cavity by removal of the wall, this is the procedure of choice. If simple measures fail, or if the nature of the structure is such as to prevent collapse, the transplantation of living tissue from the same person in the form of free or pedicled transplants, is best. When possible, the pedicled transplant should be employed. Kanavel's use of free transplants has been limited to transplants of fat. These have been especially valuable in porencephalic cavities but useless in osteomyelitic cavities.

The author reports, with illustrations, four unusual cases in which pedicled flaps of fat and subcutaneous tissue or muscle or both combined were transplanted successfully.

In one of these cases an abscess cavity of five years' duration and the size of a large orange was found in the space of Retzius. Part of the lower half of each rectus abdominis muscle was turned down into the cavity. The drainage stopped after six weeks and the wound healed. After eighteen months the wound was still closed but there was diffuse bulging of the abdominal wall.

In the second case a frontal sinus cavity of syphilitic origin was filled in with a fat and skin flap from the forearm.

The third case was a case of bone cyst of the mandible. Part of the platysma muscle with the overlying fat and fascia on the right and part of the sternocleidomastoid muscle on the left were used to fill in the cavity.

In the fourth case an old empyema cavity was filled with the latissimus dorsi muscle.

C. R. STEINKE, M.D.

Ahlsvede, E. H.: Further Indications for Pepsin-Hydrochloric Acid Treatment. *Arch. Dermat. & Syph.*, 1921, iii, 648.

The author adds to those mentioned in a previously published article three conditions which will be benefited by the pepsin-hydrochloric acid treatment viz., epididymitis, acne, and urethral strictures.

The pepsin-hydrochloric acid was applied in the form of compresses, injections, ointment, and gutta-plasts. For compresses a 5 per cent aqueous solution was found to be best.

The following formula has been in use: pepsin, 10 gm.; hydrochloric acid, 1 c.cm.; phenol, 1 c.cm.; and water to make 200 c.cm. This solution gave excellent cosmetic results in the digestion of keloids, scars due to burns, and all kinds of cicatrices.

The author mentions Unna's suggestion to inject pepsin in the following solution: pepsin, 10 gm.; hydrochloric acid, 1 c.cm.; phenol, 1 c.cm.; and distilled water to make 100 c.cm.

To digest and soften the indurations which are so often seen after acute inflammation in cases of gonorrhœic epididymitis 5 c.cm. of a 10 per cent solution of pepsin were injected into the hardened tissue. The point of the needle was pushed through the tunica dartos up to the tunica vaginalis communis.

After three or four days the irritation and swelling due to the injection generally decreased. The treatment was then continued, two injections being given a week. In new cases three or four injections are sufficient. Old infiltrations require regular injections over a period of five or six weeks. It is advisable in these cases to combine the injections with the use of compresses of pepsin. Prophylactic compresses to prevent chronic induration in cases of acute inflammation of the epididymis were also employed with success.

Callous strictures of the urethra were treated in the same way. As these represent hypertrophy of the fibrous tissue which usually is situated in the pars bulbosa of the urethra, a bougie was first inserted. Pepsin solution (2 c.cm.) was then injected into the tissues surrounding the induration. It is recommended also that pepsin compresses with impermeable coverings be used externally at the same time.

For ambulatory treatment during the day a pepsin ointment may be easily applied: pepsin, 10 gm.; hydrochloric acid, 1 c.cm.; phenol, 1 c.cm.; and petrolatum to make 100 c.cm.

In some cases the external application of pepsin and hydrochloric acid caused a slight superficial irritation of the skin. This can be avoided by substituting boric acid for the hydrochloric acid.

THEODORE DROZDOWITZ, M.D.

ASEPTIC AND ANTISEPTIC SURGERY

Finger, J.: Antiseptic Treatment of Infected Wounds (Erfahrungen in der antiseptischen Behandlung infizierter Wunden). *Muenchen. med. Wchnschr.*, 1921, lxviii, 631.

The destruction of bacteria in the body by means of antiseptic substances has not yet been accomplished. However, when the process appears to be quiescent, such substances are employed, not with the idea of destroying the bacteria, but to produce a hyperæmia by stimulating the tissues. In the use of antiseptics the stimulative power of the substance must be given as much consideration as the wound conditions.

The author has had very good results with yatrín, an iodine-oxychinolin-sulpho-acid with an iodine content of about 30 per cent. Following its application there is rapid regression of the inflammation and the wound becomes clean. The beneficial effects of yatrín may be ascribed to both a bactericidal and a tissue-stimulating action. Injections cannot be made around inflammatory foci because they are very painful. Abortive treatment of wound infection with yatrín has not been attempted.

WINIWARTER (Z).

Butler, E.F.: The Surgical Sterilization of Wounds. *Am. Med.*, 1921, n. s. xvi, 295.

The theory of surgical sterilization, or débridement, is that in a recent, grossly contaminated wound it is possible to remove by mechanical means all substances favorable to bacterial growth and all bacteria so thoroughly that the wound may be closed immediately by primary suture with every prospect of prompt aseptic union. This operation must be performed before the period of acute infection, the patient's condition must permit operative treatment, the operating room facilities must assure perfect asepsis, and the skill of the surgeon must be adequate for the task. Once the period of contamination has passed and the period of acute infection has been established, surgical intervention

is extremely unwise. Under military conditions the period of contamination was gauged at from eight to twelve hours, but under conditions of civil life it may be estimated safely at from twelve to eighteen hours.

Débridement is not a simple procedure. It requires time and, in the very great majority of cases, general anaesthesia. It demands also more than average surgical ability. The aseptic precautions require a degree of teamwork which can be obtained only by long practice. Early in his experience the surgeon should delay closure of the wound for a few days following débridement, but as his skill increases he may add immediate primary suture.

Military surgery established the fact that it is safer not to close wounds in which great numbers of streptococci or faecal anaerobes are found. In civil hospitals, unless it is known that the patient is willing to remain in the institution for from seven to ten days, immediate primary suture should not be attempted. Moreover, immediate primary suture in cases of metabolic disturbances, vascular changes, chronic alcoholism, or demonstrable syphilis does not promise great success. Delayed primary suture or antiseptic treatment is a wiser course.

Local anaesthesia is not satisfactory unless it is induced by nerve blocking at a point remote from the field of operation.

The author describes in detail the various steps of a typical débridement, including the excision of the traumatized and contaminated skin edge, hæmorrhage, excision of the devitalized muscle, preservation of the periosteum, removal of detached fragments in joint injuries, resection of tendons, the treatment of nerve and vessel wounds, and the removal of foreign bodies.

An infected wound requires more skilled attention than a clean wound, and in a contaminated wound the prevention of infection is a still more difficult problem. Given proper technique, sound judgment, and increasing skill in débridement, a successful result should be obtained in 90 per cent of the cases.

FREDERICK CHRISTOPHER, M.D.

Hagemann: Combined Treatment of Wounds by Means of Light and Dyestuffs (Kombinierte Licht- und Farbstoffbehandlung der Wunden). *Zentralbl. f. Chir.*, 1921, xlviii, 657.

The sometimes unsatisfactory and variable influence of light on bacteria is due to the specific action of certain light rays and the marked absorption of the light by the wound surfaces. In general, the bactericidal action increases the more the character of the ray approaches the ultra-violet end of the spectrum. This is not true, however, as regards all bacteria; e. g., the spores of the anthrax bacillus are more markedly influenced by red light, while the anthrax bacillus itself is more markedly influenced by violet light. Failure rests principally, however, on marked absorption of the rays, especially of the bactericidal rays. The favorable influence of the light lies in the tissue reaction it causes.

The antiseptic action of dyes is well known. A number of dyes are bactericidal in high dilutions, and even in strong dilutions are not harmful to the tissues. They form non-toxic combinations with the tissues, however, and are not equally toxic for all bacteria.

Combined light and dye treatment has a decided action. Photochemical effects were demonstrated on staphylococci, streptococci, and colon bacilli by otherwise non-toxic solutions of eosin, erythrosin and methylene-blue. This photochemical action is obtained with direct sunlight or ordinary daylight, quartzlight, and the electric arc-light, but is much less evident when the ordinary electric-bulb light is used. When raying is done with the quartz lamp and with a 100-candlepower electric light, methylene-blue is greatly resorbed but there is no resorption of eosin or erythrosin. The resorbability of a dye is dependent upon its characteristic peculiarities as a vital stain.

The principal benefit of photochemical treatment is due to the fact that by the raying of the wound the resorption of the vital dyestuff applied to it in solution is greatly increased. A surplus of dye is thereby accumulated in the region of the wound which does not undergo non-toxic transformation and therefore exerts a bactericidal action.

WORTMANN (Z).

ANÆSTHESIA

Wallis, R. L. M., and Hewer, C. L.: A New General Anæsthetic: Its Theory and Practice. *Lancet*, 1921, CC, 1173.

Wallis' experiments revealed that pure ether does not possess anæsthetic properties. In an examination of inferior ethers in India by means of distillation over finely divided permanganate, he obtained a residue of mercaptans which was toxic and had a very disagreeable odor. He afterward removed the alcohol, water, and peroxides by treating the distillate with anhydrous copper sulphate, but as his product was then devoid of anæsthetic power he acted on Cotton's suggestion and treated this substance with carbon dioxide and ethylene. The resulting compound was found to be active.

A good anæsthetic ether treated with permanganate yields a residue of ketones with a pleasant odor and it is to these the ether owes its anæsthetic properties. Accordingly, pure ether was chosen as a solvent and varying quantities of these ketones of the middle series were added to it. Their anæsthetic properties were found to be increased by first treating them with carbon dioxide and ethylene. The product is termed "ethanesal."

Hewer used this ether in 250 cases. It was administered to patients of all ages and by various methods. Operations in which it was employed are found in practically all fields of surgery. In many cases the patient was a poor operative risk on account of some heart condition, anæmia, diabetes, or toxæmia. Hewer concludes that ethanesal is less

toxic and is safer than chloroform or ether. It is less irritating to the mucous membranes, reduces postoperative vomiting, and is practically devoid of disagreeable taste and smell. Anæsthesia is induced more rapidly as a more concentrated vapor can be used. Moreover, the time of recovery is shorter. The effect on the pulse and blood pressure is probably better than that of ether, since pulse pressure is sustained at the end of the operation.

J. W. Ross, M.D.

Bratrud, A. F.: The Present Problem of Local Anæsthesia. *J.-Lancet*, 1921, n.s. xli, 347.

Bratrud discusses the problems of local anæsthesia and the advantages and disadvantages of the various drugs used at the present time. From his experience he draws the following conclusions:

1. The subject of local anæsthesia should be taught in all medical schools.
2. The disadvantages, such as time, infection, psychic factors, etc., are more imaginary than real.
3. Careful attention to details, better knowledge of anatomy, and improved technique are essential for success.
4. The postoperative course is a better convalescence in a shorter period of time with fewer complications.
5. Limitations of the field should be known and combined anæsthesia should be used as soon as there is a contra-indication to any further work under local anæsthesia.
6. A knowledge of this subject is of special importance to the rural districts and hospitals without a consultant or visiting anæsthetist.
7. The future of local anæsthesia depends upon the enthusiasm of the surgeon, his knowledge of the subject, and the widening of its field of usefulness.

ISABELLA C. HERB, M.D.

Maxeiner, S. R.: The Technique of Administering Local Anæsthesia. *J.-Lancet*, 1921, n. s. xli, 346.

Maxeiner is of the opinion that novocaine is thoroughly efficient and the safest local anæsthetic available today. It may be used almost *ad libitum* when properly administered. Concentrated solutions are more toxic than dilute solutions. Intravenous administration is the most dangerous and should be avoided. The use of a tourniquet or of adrenalin solution adds to the duration of the anæsthesia, but adrenalin solution is dangerous in the presence of a terminal circulation. Infiltration is by far the most simple method of inducing anæsthesia and is almost 100 per cent efficient. Edematization of the field may have certain disadvantages, but if properly performed does not interfere with the operation or with primary healing as is so often claimed.

Intraneural injections are especially applicable to the fifth nerve and its branches, the brachial plexus over the midpoint of the clavicle, and the ulnar and sciatic nerves. They often fail, however, and demand much greater skill than perineural injections or infiltration block. By the latter method a

larger amount of a more dilute solution may be deposited in proximity to the nerve and therefore in the hands of the average surgeon this procedure is more efficient.

Circumferential infiltration has a distinct field of usefulness in cases of umbilical hernia, amputation of the breast, and the removal of large, superficial tumors or tumors with broad bases. In caudal anæsthesia the anæsthetic solution is introduced through the terminal sacral foramen and is extradural. This method produces ideal anæsthesia for operations on the perineum and in the pelvis, but is not absolutely free from danger and may sometimes fail. Splanchnic anæsthesia is as yet not fully developed. The retroperitoneal tissues may be reached through the liver, and the nerve supply to the bile ducts, the stomach, the bowel, uterus, and other organs may be completely and efficiently blocked.

ISABELLA C. HERB, M.D.

Chevassu, M.: The Removal of a Tuberculous Kidney without Pain or Shock under Local Anæsthesia and with a Single Anæsthetic Puncture (Rein tuberculeuse néphrectomisé sans douleur et sans choc sous anesthésie locale au moyen d'une seule piqûre). *Bull. et mém. Soc. de chir. de Par.*, 1921, lxvii, 883.

The local anæsthesia in this case was induced by the injection of 120 c.cm. of $\frac{1}{2}$ per cent French novocaine solution to which 14 drops of adrenalin were added. A needle 12 cm. long was employed and the injection was made into the splanchnic nerve. Anæsthesia of the splanchnic nerve gives anæsthesia of the renal pedicle. Anæsthesia of the lumbar wall requires, in addition, paravertebral anæsthesia of the last intercostal and the first lumbar nerves.

For a nephrectomy it is necessary to inject two planes, viz., the plane of the twelfth intercostal and the first lumbar nerves and the vertebro-renal plane: Chevassu injected 60 c.cm. of the anæsthetic solution into each of these two planes by means of a single puncture made at the lower border of the twelfth rib on the left side at about five finger-breadths from the median line, the needle being inclined inward and slightly upward. When the needle had been inserted from 4 to 6 cm. the first plane was anæsthetized and the direction of the needle then changed. Between the eighth and the eleventh centimeter of insertion the second plane was anæsthetized. The patient, a man 29 years of age, was entirely free from pain and shock. Postoperatively there was no vomiting, nausea, or dyspnoea.

W. A. BRENNAN.

Perrier, G.: Local Anæsthesia in Abdominal Surgery: Anæsthesia of the Splanchnic Nerves (L'anesthésie locale en chirurgie abdominale: anesthésie des nerfs splanchniques). *Rev. méd. de la Suisse Rom.*, 1921, xli, 355.

While ordinary surgical procedures, and even cauterization, do not cause pain when performed under simple parietal anæsthesia, traction on glan-

dular pedicles and the mesentery is painful and if prolonged gives rise to circulatory and respiratory reflexes. Under such circumstances the operation can be continued only under general anaesthesia.

The author is not a partisan of spinal anaesthesia especially as applied in the upper parts of the abdomen. Paravertebral anaesthesia also appears to him impractical and complicated as eleven injections on each side of the spinal column are necessary for a laparotomy.

Numerous investigations regarding the sensibility and innervation of abdominal organs have shown that the tissues surrounding the great vessels which contain the visceral nerves are sensitive. The visceral irritations are conducted to the central nervous system principally by the splanchnic nerves. The idea of anaesthetizing these nerves originated with Kappis in 1913. Pauchet introduced the method into France.

The author describes the technique of splanchnic nerve anaesthesia briefly and enumerates the errors to be avoided as follows:

1. Injection into the lumbar muscles. This occurs when the needle makes contact with the transverse apophysis instead of with the deeper vertebral body.

2. Injection into an important vessel. This is possible when aspiration before injection is neglected.

3. Injection into the pleura and lung. This may occur when the injection is made too high.

4. Injection into an abdominal organ. This may occur if the injection is made too low.

Splanchnic nerve anaesthesia has been entirely satisfactory in many cases. Graef, however, saw it fail in two cases of ileus, and Perrier had it fail also in a similar case. Perrier reports eighteen laparotomies he performed under splanchnic nerve anaesthesia. In two he was obliged to use ether to finish the operation. One of these was a case of ileus. All of the patients were in a deplorable condition on account of old age, anaemia, or some other condition but there was no operative death nor any postoperative complication, and no change in the pulse or respiration was noted when traction was exerted upon the stomach or the liver was reflected. Contra-indications to the method are marked obesity, nervousness, and fear.

In Perrier's opinion splanchnic anaesthesia is a decided step toward the abolishment of general anaesthesia induced by inhalation and in many cases is decidedly better than general inhalation anaesthesia.

W. A. BRENNAN.

SURGERY OF THE HEAD AND NECK

HEAD

Walton, A. J.: Surgery of the Pituitary Gland.
Lancet, 1921, cc, 1168.

The functions of the various portions of the pituitary gland may be classified roughly as follows:

1. Anterior lobe. The secretion of this part of the pituitary body appears to control calcium metabolism and skeletal growth, including the bony, cartilaginous, and connective-tissue structures. It may possibly control the deposit of fat and the growth of the sexual glands.

2. Posterior lobe. This portion of the pituitary contains a pressor and depressor substance in its extract which, when injected, causes a rise or a fall in blood pressure. A diuretic action leading to polyuria with dilatation of renal vessels is also noted. A most important action is the constant effect of contraction on unstriated muscle, especially in the intestine and uterus.

In addition, there is a body which appears to lower the carbohydrate tolerance. There is some question, however, as to whether this is formed by the anterior or the posterior lobe.

The clinical symptoms due to pituitary lesions fall into the following classes: (1) disturbances of the internal secretions, (2) local pressure effects, and (3) general pressure effects.

Disturbances of internal secretion indicate that an increase in function of the anterior lobe produces gigantism in young persons and acromegaly in adults. Decrease in function of the lobe produces

atelioidosis (Lorain's disease) in young persons but its effect on adults is unknown. The effect of an increase in function of the posterior lobe is also unknown. A decrease in its function causes dystrophia adiposa genitalis (Froelich's disease) in young persons and adiposa dolorosa in adults.

Sternberg showed that 20 per cent of acromegalics are giants and 40 per cent of giants develop acromegaly. Brissaud was the first to point out that acromegaly is probably gigantism of adult life and the gigantism may be regarded as acromegaly occurring during the growth period. Moreover, gigantism and acromegaly may be found in the same family.

Acromegaly, which was described by Pierre Marie in 1886, appears to depend on an over-growth of the anterior or glandular portion of the body. Cases have been reported of hæmorrhage or cyst formation in the anterior lobe.

This condition most commonly begins at about the thirtieth year of age and is slow in onset. The bones of the spine, thorax, head, and face show thickening and hypertrophy. There may be an increase in height with kyphosis of the spine. The thorax and the pelvis are enlarged, widened, and deepened. The cranium is only slightly altered, but the face shows general hypertrophy, especially the lower jaw, in which the teeth become widely separated. The great length of the face is due largely to downward hypertrophy of the jaw. The pituitary fossa is generally enlarged and there may be atrophy or erosion of the clinoid processes. The soft tissues

about the face also share in this hypertrophy, becoming thickened and prominent. The hands and feet are widened and thickened because of overgrowth in all tissues, such as bones, muscles, connective tissue, and skin. In women the breasts become smaller than normal and amenorrhœa occurs early. The external genitalia are hypertrophied, but there is always a marked decrease in sexual desire. The thyroid may be small and the larynx hypertrophied with resultant change in the timbre of the voice. The skin shows profuse sweating and pigmentation, while the hair is coarse and wiry. The intelligence is usually good.

Persons with ateliosis, or Lorain's disease, are small and well-proportioned. There is failure of development of the secondary sexual characteristics which causes a subject who is 35 or 40 years old to appear about 14 years of age. The bones are small and fragile with poor muscular attachments. There is no enlargement of the epiphyseal ends. The skin is soft, delicate, and white, resembling that of a young female. The body and face remain hairless and the voice is high, thin, and piping. The sexual glands are never developed and the intelligence is always below normal.

Dystrophia adiposa genitalis (Froelich's disease) shows a marked over-growth of the subcutaneous fat. There is a relatively greater thickening of the buttocks and thighs and a subcutaneous deposit in the region of the breast. The blood pressure is low and there is good tolerance to carbohydrates. The skin is soft, there is no growth of axillary hair, the voice is high-pitched and squeaky, and the thyroid is small. The genitalia remain underdeveloped. A cyst or tumor with destruction of the pituitary gland is often found at operation or autopsy.

Adiposa dolorosa (Dercum's disease) is a type of Froelich's disease and appears to be due to a diminution of the secretion of the posterior lobe which occurs after the normal development of the body has been completed. It is characterized by large, irregular, and painful deposits of fat, either diffuse or localized but occurring mostly in the buttocks and thighs, although not uncommonly in the back or on the posterior aspect of the arms. Alteration is found in the pituitary gland, and many cases show also an affection of the thyroid.

Local pressure symptoms in affections of the pituitary gland are due chiefly to interference with the optic tracts or chiasma. One of the earliest symptoms is a bitemporal hemianopsia. Marked diminution in the visual fields and vision for colors may be associated with any of the alterations of secretion. Severe attacks of fifth-nerve neuralgia may also be present, but are not frequent. General pressure symptoms are due chiefly to an intracranial pressure increase which varies with the nature and extent of the lesion.

Tumors of the pituitary gland are, as a rule, relatively benign and should be described as adenomata in spite of the fact that microscopically they often appear carcinomatous. Rare forms of squamous

carcinoma are of course an exception. Diminution of secretion is usually associated with a cyst or tumor causing pressure on the gland. Since most of the conditions associated with an alteration of secretion are very slow in their progress and may persist for years, and since operation is necessarily attended by a high mortality, interference will be indicated chiefly by the presence of local or general pressure symptoms. Danger of complete blindness and increasing headache and vomiting are also weighty considerations.

The author prefers the cranial to the intracranial approach in operations and uses a modification of the Frazier method. A large frontal flap is made and turned outward. The lower limb passes around the margin of the eyebrows and the upper lies about $3\frac{1}{2}$ in. above and parallel to this and thus well within the area of the hairy scalp. These two incisions are connected by a vertical limb in the middle of the forehead. Four trephine openings are made and united with a Gigli saw, and the bony flap, 3 in. square, is turned outward. The dura is elevated as far as possible from the orbital roof and an incision parallel to the orbital ridge is made into it. The frontal lobe is carefully elevated with a broad metal retractor and the cerebrospinal fluid gently swabbed away. A clear view of the optic nerve and chiasma is obtained and the pituitary gland and any tumor may be removed from the position in which it is most prominent.

A. C. JOHNSON, M.D.

Ashhurst, A. P. C.: Recurrent Unilateral Subluxation of the Mandible; Excision of the Inter-articular Cartilage in Cases of Snapping Jaw.
Ann. Surg., 1921, lxxiii, 712.

The author reports the case of a girl 16 years of age who was admitted to the hospital April 16, 1920. The subluxation, which dated back for two years, involved the right side and in the beginning occurred about once a month, but for the last four months had been more frequent. She had been able to reduce the displacement without aid until January, 1920, when it became necessary to call a physician because it recurred even when the chin was bandaged and no attempt was made to open the mouth. Subsequent to this there were frequent dislocations which were painful and were reduced only with difficulty by physicians.

On admission the patient's mouth was held shut with a bandage and she was hysterical. She had taken only liquid food for some time. Dislocation occurred several times before operation while she was in the hospital. X-ray examination showed that at the time of displacement the mandible on the affected side rode forward on the maxilla.

The theories as to the factors responsible for this type of dislocation are various. The author states that, whatever the cause, it is evident that the cartilage is at fault and that the simplest and most certain method of effecting a cure consists in removing the cartilage from the condyle. He believes

this operation is better than any other. In the case reported it was done May 1, 1920. The technique was as follows:

An incision 2 cm. long was made over the zygoma back to the auricle, and then downward for 3 cm. in front of the auricle. The masseter muscle was detached subperiosteally and the small triangular flap of skin and muscle turned down. The cartilage, which was loosely attached, was caught in a tenaculum and excised with the scissors. The incision was closed in layers without drainage.

Convalescence was uneventful. May 7, 1920, the patient was able to eat vegetables. May 11, she could open her mouth 2.5 cm. without causing luxation. When seen again in November, 1920, she stated that she had had no further trouble.

F. G. MURPHY, M. D.

Bufalini, M.: Three Cases of Cystic Tumors of the Jaw (Studio sopra tre casi di tumori cistici dei mascellari). *Clin. chir.*, 1920, xvii, 1249.

The author reports the clinical history and histologic character of three cystic tumors of the jaws which were extirpated by him. In the first case the tumor was an adamantine cyst of the mandible characterized by adamantine tissue which in some regions showed a papillary formation. In the second case the tumor was a paradental cyst of the upper jaw and more particularly juxtaparadental, according to Ombrédanne's classification of such tumors. The third tumor was a voluminous cyst of the mandible showing stratification and other characteristics which differentiated it somewhat from the more common paradental cysts. It was lined throughout with epithelium and there was no tendency to transformation into stellate polygonal cells and no formation of epithelial patches in the connective stroma as is common in paradental cysts.

Bufalini is of the opinion that among paradental cysts three secondary groups should be recognized on the basis of differences in their histologic characters, viz.:

1. Cysts of inflammatory nature originating secondarily from the epithelium of the buccal mucosa or from paradental epithelial rests.
2. Cysts which are derived directly from epithelial rests.
3. Cysts which, because of their location and lack of direct relationship to the roots of the teeth, and especially because of the character of their epithelial lining, seem to have been derived from the inclusion during intra-uterine life and the later development of epithelial remnants of the buccal mucosa of the antrum of Highmore or the nasal fossæ.

W. A. BRENNAN.

Koenig, F.: A Plastic Operation on the Lip (Ueber Lippenwechselplastik). *Beitr. z. klin. Chir.*, 1921, cxvii, 288.

Almost all the previous plastic operations on the lip (Dieffenbach's, Jaesche's, Langenbeck's, Est-

lander's, Lexer's) are based on lateral displacement of flaps from adjacent parts of the face. These methods are justified in large losses of tissue, as in total loss of the lip, but not in smaller defects where the demand for anatomical replacement is secondary to that of preserving the normal play of the muscles about the mouth. In the latter type of case they produce greater or less disturbance of the innervation of the important muscles at the angle of the mouth.

The author therefore recommends a method which was used by Abbe to widen the upper lip which had become too short after an operation for harelip and to cover lip defects after trauma and operation. The technique of this procedure is as follows:

Tension of the upper lip is overcome by a median-incision. A wedge is cut from the lower lip with the apex downward so that one limb of the acute angle passes through the mucous membrane of the lip while the other stops in front of the inferior labial artery. The wedge is then turned upward in the frontal plane and sutured into the opening in the upper lip. After eight to ten days the pedicle is cut and the remaining wound is sutured.

A modification of this method, in which the flap was made more rectangular and the defect at one side, was used by the author in ten cases of injury and carcinoma. The results were excellent. The operation is shown in three illustrations. The flaps must be made the same size or a few millimeters smaller than the defect rather than larger as is done in other plastic operations. A good condition of the wound edges is also essential; if necessary they may be freshened. If some of the sutures do not hold, the flap of the pedicle should not be cut until two days later than usual, i.e. on the twelfth day.

The author's operation can be performed very well under local anæsthesia and is indicated both in the usual conditions and after failure of other plastic methods. It is necessary only that the loss of substance shall not be more than half the lip. The histories of three cases operated upon by this method are given.

KEMPF (Z).

NECK

Judd, E. S.: A Consideration of the Treatment of the Lesions of the Thyroid Gland. *Minnesota Med.*, 1921, iv, 315.

The thyroid gland has only recently come to be regarded as of great importance in metabolism. Knowledge of the function of the thyroid has been obtained largely from a study of the results of total removal and persons whose thyroids have never functioned.

The absence of the thyroid produces a syndrome known as myxœdema or hypothyroidism. Children with total absence of thyroid function are known as cretins; in development they never reach the stage of puberty. After complete thyroidectomy the rate of metabolism is greatly reduced; the growth of the

osseous system is arrested, especially in the long bones, the skin becomes myxœdematous, and the intellect is disturbed. If the thyroid is removed from young animals, development is retarded, especially in the nervous and genital systems. The hair and nails become brittle. If the thyroid is removed from an adult animal the results are the same except that the skeleton is already fully developed and does not change.

Very little has been accomplished to change the condition of cretinism in the human being. Some of the difficulties which result from absence of the thyroid gland can be overcome by the administration of thyroid extract or of thyroxin, the active principle of the gland. The greatest difficulty arises from the fact that cretinism is not recognized early. In a few cases the author transplanted normal thyroid tissues, and in some, the thyroid tissue from a hyperplastic thyroid of a patient with exophthalmic goiter. The results were similar.

Little encouragement was obtained from enucleating cysts in the thyroids of cretins. Much more is accomplished with the myxœdematous patient who at some time had a normal functioning thyroid gland. All the changes which have taken place in the skin, hair, and nails, as well as the facial expression and mental condition, return to normal in a very short time after thyroid products are administered. Myxœdema is much more common than is realized but unless its evidences are constantly borne in mind it is not difficult to overlook the real condition. It is very often present when there is no discernible lesion of the thyroid and no history of former trouble. It is sometimes seen in patients who have had long-standing adenomatous or colloid goiters, and not infrequently occurs in those in whom apparently there has been hyperthyroidism at some previous time. The author has seen several cases which evidently followed thyroiditis.

Postoperative myxœdema is extremely rare. It is not unusual for the basal metabolic rate to drop after partial thyroidectomy, but this has no influence on the convalescence though frequently there is clinical evidence of insufficiency in thyroid function. If in operating for goiter a small piece of thyroid is preserved with a good blood and nerve supply, insufficient thyroid function will not result.

Tetany is much more common than myxœdema following operations on the thyroid, although it does not occur in more than 0.25 to 0.5 per cent. The syndrome is the same as in other circumstances. It is more apt to follow secondary operations when partial thyroidectomies have been performed and the second operation is done for thyroid enlargement. The parathyroids are supplied by the inferior thyroid arteries; their ligation in one case produced definite tetany. One of 2 cases of gastric tetany following gastro-enterostomy made the same response to treatment as that following treatment for tetany with goiter. The symptoms almost always begin with a stiffness in the fingers about the third day after the operation. These symptoms may pass

off in a few hours or become progressively worse until not only the fingers but the hands and arms are involved; sometimes the contractions become general. In a series of 20 patients with tetany following operation there were no deaths. All patients should be given intravenous injections of calcium lactate, 10 c.cm. of a 5 per cent solution in 100 c.cm. of salt solution, at the time of onset. The symptoms usually subside within one-half hour. Often one intravenous treatment is all that is necessary, but if there is any tendency to recurrence, the dose should be repeated. In every thyroidectomy an attempt should be made to preserve all apparently normal thyroid tissue.

For purposes of treatment enlargements of the thyroid may be classified best in five groups: adolescent, mechanical, toxic, inflammatory, and malignant goiters.

Group 1. In the adolescent goiter the enlargement in the thyroid is general. There may be a few associated adenomata but usually the enlargement is due to an increase of colloid in the gland. The patient at this stage may be nervous and have a tumor. An adolescent girl should not be operated on, even if the symptoms are supposedly due to slight over-activity of the gland. In case of doubt, conservative measures should be employed first. This type of goiter may continue to enlarge and become a mechanical goiter.

Group 2. The mechanical goiter produces symptoms only by pressure and interference with the surrounding structures.

Group 3. There are two distinct types of toxic goiter, either of which may cause mechanical interference. The toxæmia they produce is the result either of over-activity of certain elements of the thyroid or of absorption of some new product from the thyroid into the circulation. In certain toxic cases in which there is definite obstruction to the air passages the toxic symptoms may be produced by suboxidation, but in many no mechanical interference is evident.

Exophthalmic goiter is usually toxic from the beginning. The gland is generally enlarged and hyperplastic, and there is an accompanying exophthalmos. The second type of toxic goiter is the adenomatous goiter which, after being present for nineteen or twenty years, causes signs of hyperthyroidism. Exophthalmos is not common in this type. The disturbance of function and degeneration of tissue are more marked than the exophthalmos. The administration of any form of iodine exaggerates the symptoms. On the other hand, such treatment frequently seems to help the patient with an exophthalmic goiter. Surgery offers the best results in cases of toxic goiter. Subtotal thyroidectomy cures about 70 per cent of cases of exophthalmic goiter.

Group 4. Thyroiditis does not occur often. At the beginning the inflammation involves the whole gland; the enlargement is general and painful to the touch, and may go on to suppuration. With the

gradual destruction of thyroid tissue there is definite evidence of hypothyroidism. In case of supuration it is best to open into the softened area and drain. When the inflammation is general it is not good policy to operate. Normal thyroid function is more apt to follow conservative treatment than thyroidectomy.

Group 5. Malignant tumors of the thyroid are rare; carcinomata occur in less than 1 per cent and sarcomata are almost never seen. Even the growths operated on early are prone to recur in a comparatively short time. Usually when treatment is sought for carcinoma the condition is almost hopeless.

J. E. STRUTHERS, M.D.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Hedblom, C. A.: Tumors of the Bony Chest Wall.
Arch. Surg., 1921, iii, 56.

There is perhaps no surgical condition of the chest so germane to the discussion of pneumothorax as that of tumors of the bony chest wall. These tumors, either malignant or potentially malignant, often involve a large portion of the wall of the thorax and their extirpation requires extensive resection resulting in sudden collapse of the lung. Unlike infectious conditions of the chest, they do not produce inflammatory adhesions of the pleura or thickening and fixation of the mediastinum. The posture of the patient and the nature of the operation, which make it impracticable to exert traction on the lung to steady the mediastinum, combine to bring about the maximum of mechanical disturbance due to open pneumothorax. Under these conditions a study of pneumothorax incident to operation on tumors of the chest wall should be of importance with respect to both theoretical and practical considerations.

A review of the literature has brought to light reports of 67 cases operated on for tumor of the chest wall since Parham performed his first operation under differential pressure in 1898. The records of the Mayo Clinic contain 15 cases which have a bearing on the subject. Of a total of 82 cases, 18 (20 per cent) were operated on under differential pressure. Symptoms referable to the opening of the pleural cavity were noted. A weak, rapid pulse and disturbed respiration occurred in 2, but in both of these the diaphragm was resected and the symptoms abated when it was retracted and sutured. A pleural effusion developed in 1 case following operation. One patient died of pneumonia on the fourth day. In this instance the anæsthesia was considered as contributing to the unfavorable result.

In 43 cases operated on without differential pressure there were symptoms referable to the opening of the pleural cavity in 9. The severity of the symptoms depended somewhat on the size of the opening and the length of time the pneumothorax lasted.

Twelve of the patients developed postoperative complications: 2 had pneumonia; 4, pleurisy with effusion; 5, empyema; and 1, pulmonary congestion. Seven patients died. Three died of empyema, 1 of pneumonia, and 2 of shock. In one instance the cause of death was not given.

A study of these cases seems to justify the statement that operative pneumothorax is in itself rarely hazardous but seems to predispose to postoperative pleural infection. Differential-pressure anæsthesia apparatus should be at hand in case its use may be indicated, and for inflation of the lung in all cases before closure.

Jehn, W., and Mayer, K.: Penetrating Gunshot Wounds of the Thorax (Ueber Thoraxsteckschuesse). *Deutsche Ztschr. f. Chir.*, 1921, clxii, 398.

Forty-five cases are reported which were operated upon in Zurich, Singen, and Greifswald. The results were extraordinarily good and there were only three fatalities.

All penetrating gunshot wounds belong to injuries which cause clinical symptoms for the first time after periods of months or years. Penetrating gunshot wounds with the bullet remaining in the lung often heal permanently without unfavorable after-effects. Others, however—and these constitute no small number—sooner or later give rise to severe symptoms and in such cases the removal of the foreign body is necessary to save the patient's life.

In penetrating gunshot wounds of the chest wall fistulæ frequently persist. In some cases they may close spontaneously.

Following penetrating gunshot wounds of the pleura there may be empyema. Gunshot wounds of the lungs cause abscesses, gangrenous foci, erosions of the vessels, and aneurisms, while similar wounds of the mediastinum are followed by spontaneously closing fistulæ.

In wounds of the chest wall the projectile and splinters of bone may enter the periphery of the lung and cause changes in the lung cortex. The author cites a case in which, two years after the injury, a small lung abscess cavity containing a sequestrum from the rib and communicating with the bronchus was closed successfully by operation. In penetrating wounds of the pleura the projectile may enter the free pleural space and cause repeated hæmorrhage which endangers life and necessitates removal. As a rule, however, empyema or encapsulated abscesses develop which may be reached by means of a differential-pressure apparatus. Penetrating gunshot wounds of the lung cause abscesses or gangrenous foci which at times involve the bronchi or pleura or, by causing severe hæmorrhages due to an aneurism or erosion of vessels, may lead to aspiration pneumonia.

The condition of the patient with abscess varies. As a rule he is cachectic, a characteristic symptom of abscess or gangrene. If such a focus ruptures into the pleura a diagnostic error may be made; one may recognize the empyema but not the cause of the lung focus. In not a few cases, metastasis (brain abscess) following a smooth course toward recovery leads to death. In order to save life when it is threatened by recurring hæmorrhages or abscess formation an exact determination of the position of the bullet and the use of a differential-pressure procedure are necessary.

The anatomical changes are often relatively slight. The lung, which in the region of the bullet is usually thickened, is fixed over the bullet with two catgut sutures and opened between the sutures, preferably with the Paquelin cautery. The bullet is removed, bleeding vessels and possible aneurisms are ligated, aseptic lung wounds are closed, and infected wounds are sutured and drained. When the general pleural cavity is not obliterated the lung abscess is operated upon in two stages under light anaesthesia which is interrupted when the Paquelin cautery is being used. The lung must be exposed by the resection of four or more ribs, the abscess treated with the Paquelin cautery, the foreign body removed, and the cavity well tamponed. Air emboli and hæmorrhage may interrupt the operation or may occur later during the after-care, as when the dressings are changed. Bronchial fistulæ which do not close spontaneously are closed operatively.

The localization of bullets in the mediastinum often offers considerable difficulty because of the heart. The histories are given of cases in which stone splinters were successfully removed: (1) from a grossly thickened pericardium and the lung; (2) from the lung and the wall of an aneurism; and (3) from the pars diaphragmatica of the pericardium. Le Fort in 100 operations on the mediastinum and its neighborhood in the cases of 97 patients removed 106 projectiles. The mortality was 7 per cent.

Careful examination, exact localization of the foreign body, and the use of the proper modern surgical instruments render the danger of operative interference in such cases very slight. SIMON (Z).

Eastwood, E. H., and Martin, J. P.: A Case of Primary Tumor of the Pleura. *Lancet*, 1921, cci, 172.

The authors present the case of a man 38 years old whose chief complaint was shortness of breath progressively growing worse and a painful point at the juncture of the third costal cartilage and the sternum where examination revealed a prominence. In the further progress of the case aspiration was done several times, a straw-colored fluid being withdrawn. The patient died suddenly six weeks after admission to the hospital and eleven weeks after the onset of symptoms.

Autopsy revealed a growth in the form of a massive nodular thickening of the parietal pleura lining all the ribs, the costal cartilages, the sternum, and

the diaphragm on the right side, which to some extent had spread on the visceral pleura at the root and base of the right lung. Its greatest thickness, about $\frac{3}{4}$ in., was in the region of the angles of the eighth to the eleventh ribs. The space between the lung and the tumor contained about 2 qts. of blood-stained fluid.

The true nature of such tumors has been the subject of much controversy, as is evidenced by the variety of names given them, such, for example, as endothelial cancer, sarcocarcinoma, alveolar endothelial sarcoma, and mesothelioma.

In the case reported the general histologic appearance of the growth and the fact that it was almost entirely confined to the pleura and had only slightly and superficially involved the lung, seemed to indicate that the endothelial lining cells of the pleura were the primary source. Thus, according to Adami's nomenclature, it would be called a mesothelioma.

The age incidence of such tumors is said usually to be between 40 and 60. They are slightly more common in males than in females and are more often on the right than the left side. They are frequently associated with profuse blood-stained exudate, although many cases are described in which the pleural cavity was completely obliterated by the growth. Extension is usually by direct infiltration rather than by the blood stream.

J. E. STRUTHERS, M.D.

TRACHEA AND LUNGS

Scrimger, F. A. C.: Postoperative Massive Collapse of the Lung. *Surg., Gynec. & Obst.*, 1921, xxxii, 486.

The author reports 7 cases of postoperative massive collapse of the lung occurring in a general surgical service of 540 cases. Four of these patients were operated upon for inguinal hernia, 2 for acute appendicitis, and 1 for hæmorrhoids. In 4 cases the collapse was on the right side, and in 3, on the left side. The patients' ages varied from 20 to 41 years. Anaesthesia was induced with chloroform and continued with ether. All of the patients recovered.

The symptoms, which began in every case within the first twenty-four hours, consisted of short, rapid respiration, respiratory distress, orthopnoea, pain in the affected side, fever, cough, and later expectoration. In 2 cases the matter expectorated was blood-stained. The symptoms persisted from two to four days. In 3 cases they terminated suddenly, but in the remaining 4 the improvement was gradual.

The most characteristic sign was displacement of the heart to the affected side. This side appeared smaller and its respiratory movements were diminished. Breath sounds on the affected side were at first suppressed and later blowing in character. An X-ray examination, made in 5 cases, showed density of the lung involved.

Pasteur believed that reflex inhibition of the diaphragmatic movements or paralysis of the diaphragm lasting over a period of forty-eight hours

leads to collapse of the lung and that postoperative collapse is due to a reflex arrest of action of one-half of the diaphragm. Bradford agrees essentially with Pasteur but suggests that spasm of the bronchioles might sufficiently explain the condition. Brisco emphasizes the effect of the prolonged supine position. Elliot suggested that the collapse might be due to blocking of the bronchioles by mucus.

The author reports 7 cases in detail. That the actual size of the lung was diminished was shown in all cases by the displacement of the heart and mediastinum to the affected side, and in several, by the greatly arched diaphragm.

Experimental work by Carlson is cited in which it was shown that in some amphibians a certain amount of control over the size of the lung seems to be exerted by the vagus nerve. The author suggests the possibility that, through a normal vagus control, the abdominal interference may cause a contraction of the muscular elements of the lung and that post-operative collapse of the lung may be brought about by this factor aided by the subsequent collection of sufficient mucus to prevent the passage of air beyond the point of obstruction. This theory would explain also the sudden relief of symptoms.

R. C. WEBB, M.D.

Jacobaeus, H. C.: The Cauterization of Adhesions in Pneumothorax Treatment of Tuberculosis.
Surg., Gynec. & Obst., 1921, xxxii, 493.

The operation described is performed through only two punctures. Through one puncture a straight cystoscope, the "thoracoscope," is introduced, and through the other, a small metal rod with a platinum wire loop at the end. The loop may be rendered incandescent when the operator, guided by the thoracoscope, locates and cauterizes the adhesions. Under local anaesthesia the thoracoscope is introduced in the line of the scapula as high up as possible—to about the fifth or seventh interspace when the adhesions are near the apex, and further down when they are at the middle or the base of the lung. The thoracoscope should be near the adhesions. The galvanocautery is introduced through a straight cannula usually in the middle or anterior axillary line from the sixth to the ninth interspace, but sometimes further anteriorly. Preceding the operation a design is made of the position of the adhesions on the anterior and posterior wall by orthodiagraphy after the method of Saugman.

Small string adhesions are burnt off in less than a minute, while large flat adhesions may require as long as two hours for their destruction. In the one case in which hæmorrhage occurred the author believes it was due to a too hot cautery. He stops hæmorrhage either by increasing the air pressure or by injecting sterile saline under pressure.

Jacobaeus reports 40 personal cases and about 60 cases from several clinics treated by his method. The chief complication to be watched for during the operation is hæmorrhage, while the chief complication afterward is pleurisy. Of the pleuritic com-

plications there are two of importance: (1) a simple exudate due to the thermal irritation, and (2) tuberculous pleurisy. The tuberculous pleurisy has thus far resulted in an 8 per cent mortality. In 26 of the author's 40 cases a satisfactory pneumothorax was obtained. Pleurisy with serious consequences occurred in 4 cases.

Three cases are reported in detail.

R. C. WEBB, M.D.

Gask, G. E.: Surgery of the Lung and Pleura. The Present Position of Surgery with Reference to Diseases of the Thorax. *Lancet*, 1921, cc, 1286.

During the war surgeons learned to open the pleural cavity, control hæmorrhage, and repair a wounded lung with good results. Lessons learned in military practice should be applied to civil surgery. As the danger of sepsis has been eliminated, the only dread that remains is the danger of producing a pneumothorax.

Good exposure is necessary in thoracic surgery and can be obtained without serious disturbance to the patient. The thoracic viscera may be manipulated without producing shock. Positive-pressure apparatus and intratracheal insufflation are unnecessary, although brilliant work has been accomplished by their use.

The diagnosis of chest lesions continues to be difficult. Careful study of the case with attention to a history of pain, cough, and difficulty in breathing and swallowing is essential. A complete physical examination and macroscopic and microscopic examinations of the sputum are indispensable. The spirometer, bronchoscope, and œsophagoscope are useful in their respective, though limited, spheres. Exploratory puncture, and even exploratory thoracotomy, frequently must be employed when other methods have failed to yield a satisfactory diagnosis.

Access to the pleural cavity is usually obtained from behind or from the side. Longitudinal L-shaped incisions or the flap method may be employed. Wide exposure may be secured by subperiosteal removal of one or more ribs or by the osteoplastic flap method. The chest is closed without difficulty by means of a suture passed either through or around the ribs immediately above and below the incision.

Splitting the sternum permits exploration of the upper and inner part of the chest and mediastinum. This may be done by either of two methods. By the first method an incision is made from $\frac{1}{2}$ in. above the sternum in the midline and curved to the third rib 1 in. external to the edge of the sternum. The attachment of the intercostal muscles in the second intercostal space is cut. A director is passed from the second space to the manubrial notch, immediately under the bone. The bone is then split with a special pair of sternum shears, and the edges of bone are separated with retractors. By the second method the sternum is split in the midline and a

flap of sternum with the attached ribs is turned up. The internal mammary vessels are ligated and divided as they come into view. At the end of the operation the flap is replaced and sutured in position, and the chest closed.

Reference is made to the treatment of acute and chronic empyema and of chronic empyema with sinus formation. The author believes that through experience thoracotomy will become as useful and as frequently performed as laparotomy.

MERLE R. HOON, M.D.

PHARYNX AND OESOPHAGUS

Hastings, S.: An Account of Two Cases of Obstruction of the Oesophagus by a Foreign Body Acting as Ball-Valve. *Proc. Roy. Soc. Med., Lond.*, 1921, xiv, Sect. Laryngol., 38.

The first case was that of a woman 30 years of age who, for the last thirteen years, had had difficulty in swallowing. The onset of the condition was sudden. With the oesophagoscope a large cherry stone was found resting like a ball-valve on a smooth fibrous stricture of the oesophagus, the lumen of which was not quite large enough to allow it to pass. The stone was successfully removed.

The second case was that of a woman 52 years of age who had a sudden obstruction in swallowing. In this instance a large hard pea was removed from the oesophagus.

E. C. ROBITSHEK, M.D.

Fletcher, G. W.: A Review of Thirty-Three Cases of Foreign Bodies in the Oesophagus, Bronchi, and Larynx. *Canadian M. Ass. J.*, 1921, xi, 332.

Fletcher reviews 33 cases of foreign bodies in the oesophagus, bronchi, and larynx, and reports 6 cases in detail.

In children the two chief factors responsible for such cases are: (1) the practice of allowing them to place all sorts of foreign bodies in the mouth while at play, and (2) some emotional crisis causing quick intaking of air, such as occurs in laughing, crying, shouting while running, etc.

In adults common causes are: (1) imperfect mastication of food due to carelessness, too rapid eating, or imperfections or absence of the teeth; (2) imperfect preparation of the food whereby pieces of gristle, bone, or other foreign substances are served; (3) the presence of tooth plates which may be a contributing cause lessening the sensibility of the mouth; (4) the inhalation of foreign bodies during periods of sleep or unconsciousness; (5) the aspiration of a tooth during extraction under general anaesthesia; and (6) occupational accidents.

After mentioning the symptoms the author states that the routine procedure used in making the diagnosis should consist of the following steps:

1. The careful taking of the history.
2. Examination of the pharynx and larynx with mirrors.
3. Examination of the chest by a competent internist.

4. Examination with the fluoroscope and X-ray. A negative X-ray picture does not exclude a foreign body as many bodies are pervious to the rays and cast no shadow. An atelectatic lung or lobe suggests complete occlusion of the main bronchus or branch supplying the lobe.

5. X-ray localization. A picture showing a disc-shaped body of wide diameter from side to side indicates a foreign body in the oesophagus. If the wide surface is antero-posterior, it is in the larynx or trachea. An oblique position of a foreign body in the thoracic region indicates a main bronchus as its site.

6. Examination with the tube.

7. Immediate removal of the offending substance.

Fletcher concludes with the following significant remarks:

"I regard bronchoscopy as a specialty within a specialty. This is a very exacting line of work, success in which requires the exercise of very special qualities on the part of the operator. The first of these is patience. Jackson emphasizes this repeatedly and advocates the practice of gentleness combined with mechanical ingenuity rather than the use of too much force which in difficult cases is always a temptation.

"The chief problem undoubtedly confronting the beginner is that of securing sufficient opportunity to acquire knowledge and experience. A thorough study of the anatomy of the subject, of the instruments used, and the method of using them is indispensable. Of great importance is previous practice on the cadaver, and the use of the mannikin; also the opportunity of assisting a competent operator in previous operations.

"I may mention also the necessity of close supervision and personal inspection of apparatus by the operator himself previous to operation. It is very disconcerting to be compelled to stop in the middle of an operation on account of a defective light, or to adjust a forceps which is not working properly.

"Last, but not least, I wish to refer to the practice which I shall call 'the massing of work.' Even in a large city it is highly desirable that this line of work be done by one man. These cases are not numerous, and it is much better and more expedient from the standpoint of the patient that this should obtain."

O. M. ROTT, M.D.

Hawes, J. B.: Broncho-Oesophageal Fistula and Traction Diverticulum. *Am. J. M. Sc.*, 1921, clxi, 791.

The diagnosis of broncho-oesophageal fistulae is sometimes made by recognizing in the sputum particles of food ingested. In one case mentioned it was based on the discovery of pus which contained tubercle bacilli on the end of a stomach tube. Two case histories with findings are given.

The author calls attention to the fact that foreign bodies in the lungs, such as articles of food and barium (X-ray examination), do not have such

disastrous effects as might be supposed. In the cases reported portions of the barium meal could be traced through the lung. In the first case it passed through the broncho-oesophageal fistula to an external opening, and in the second case, from the oesophagus to a cavity connected with the mediastinal glands and from there into the bronchi and out through the trachea.

I. W. BACH, M.D.

MISCELLANEOUS

Samaja, N.: Eventration of the Diaphragm Caused by Calcification of Glands in the Anterior Mediastinum (Calcificazione nel mediastino anteriore ed eventratio diaphragmatica). *Riforma med.*, 1921, xxxvii, 485.

A man 63 years of age was operated upon for incarcerated hernia. During the X-ray examination eventration of the diaphragm was found by chance. He had never had any subjective symptoms, but the objective and X-ray signs were all present — para-

doxical respiration, dextrocardia, tympany at the left base, abolition of tactile fremitus, enlargement of Traube's space, and absence of Litten's sign. The left diaphragm was higher than normal, its excursions were limited on normal and forced respiration, and in changes of pressure it acted as an inert membrane, rising when the intrathoracic pressure was decreased in comparison with the intra-abdominal, and falling when it was increased.

The eventration was evidently of recent date, for the left diaphragm was of approximately normal thickness and paradoxical respiration was not extreme. Examination for the cause of the condition showed calcified and enlarged glands in the anterior mediastinum which were responsible for pressure paralysis of the phrenic nerve. When the patient was placed in front of the roentgen screen, stimulation of the right phrenic nerve at the neck was found to cause contraction of the diaphragm, while stimulation of the left phrenic nerve with a stronger current did not.

A. G. MORGAN, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Henson, J. W.: Some Theories Regarding the Cause of Oblique Inguinal Hernia and a Suggestion as to Technique in Operating. *South. M. & S. J.*, 1921, lxxxiii, 250.

The author's views as to the etiology of oblique inguinal hernia are that the sac very seldom antedates and causes the hernia except in childhood; that in rare cases the hernia may result from intra-abdominal pressure sufficient to overcome the normal provisions for protection at the internal abdominal ring; and that usually when the hernia occurs without the presence of the enclosed peritoneal process it is due to atrophy and relaxation of the internal oblique muscle and relaxation of the transversalis fascia with enlargement of the internal ring, loss of the normal relationship between the ring and the muscle, and consequent loss of the valve-like protection the latter affords the ring.

To uphold his views Henson discusses the anatomy of the internal abdominal ring.

In herniotomy for oblique inguinal hernia his technique is as follows:

The usual steps are taken to the point of incising the aponeurosis of the external oblique and retracting the flaps. The cremaster and fascia are incised for $1\frac{1}{2}$ in. in the line of the cord and retracted widely to expose the infundibuliform fascia. The latter is incised $1\frac{1}{2}$ in. or more as the exigencies of the case indicate and the flaps are retracted with forceps clamped on the margins. After the sac has been dealt with, the lower part of the internal oblique muscle is pulled with a retractor well above the internal ring. The flaps of the infundibuliform fascia are retracted sufficiently to expose the entire circumference of the internal ring, the cremasteric

fascia being detached from the border of the internal oblique if it interferes with the exposure. The cord is separated from the infundibuliform fascia and, with a strip of gauze under it, is retracted high up.

Beginning at the lower border of the ring, two, three, or more sutures are introduced as needed and passed through one margin of the ring and across and through the opposite margin. The needle is guided with the finger in the ring to avoid the deep epigastric vessels and peritoneum. When these sutures are tied, the lower end of the new ring formed by the top suture is well up under the internal oblique muscle when the latter is in position and the margins of the ring lie in contact with the cord. In order that the circulation will not be embarrassed, however, room enough to permit the insertion of the closed jaws of a medium-sized hæmostat without resistance is left between the ring margins and the cord.

Before the internal oblique is lowered the cord is dropped into its bed and one suture is introduced at the upper border of the internal ring to stimulate round-cell infiltration and the production of new fibrous tissue to strengthen the margin of the ring. A few sutures are placed across the floor of the infundibuliform process behind the cord, and a few from one wall of this tube to the other in the front of the cord to stimulate round-cell infiltration and the formation of fibrous tissue within the infundibuliform fascia and around the cord.

The operation is completed by the Ferguson method or by inserting one suture through the lower border of the internal oblique and Poupart's ligament to bring the muscle a little lower over the canal.

Ninety-seven cases have been operated upon in this way and in three the operation was bilateral. Seventy-five of the patients have been traced. The

time after operation varies from ten months to three years. There was one recurrence.

The anatomy and the technique of the operation are illustrated by eight plates.

C. R. STEINKE, M.D.

GASTRO-INTESTINAL TRACT

Von Redwitz, E. F.: *The Pathogenesis, Clinical Manifestations, and Surgical Treatment of Chronic Gastric Ulcer* (Sur Pathogenese, Klinik und chirurgischen Therapie des chronischen Geschwüers des Magenkörpers). *Beitr. z. klin. Chir.*, 1921, cxii, 305.

This article is a brief report of the results of macroscopic and microscopic study of specimens of the stomach wall obtained from 260 cases of deep gastric ulcer. The microscopic study is based on 154 specimens, 70 of which were cut serially.

The usual site of chronic gastric ulcer is the posterior wall of the stomach near the lesser curvature. The ulcer often extends to the lesser curvature and suggests that this is its primary location. The form of the ulcer very often is that of a funnel-shaped crater. As a rule the ulcer margin is higher on the cardiac side and flattened on the pyloric side; there are, however, exceptions. Most of the ulcers studied were single. Multiple ulcers were found in only 12 of the 260 cases (4.07 per cent). In these 12 instances the ulcers were truly chronic in only 5; in the 7 other cases a hæmorrhagic erosion or acute ulcer formation was associated with a chronic ulcer.

The mucosa surrounding the ulcer was often surprisingly intact, but frequently the changes of gastritis were present. The free gastric ulcer heals by the approximation of its edges due to the pull of the shrinking scar tissue and subsequent epithelialization. The pull of the muscle attached to the ulcer margins, however, may resist the pull of the shrinking scar tissue, and this, in the opinion of the author, constitutes one of the principal factors in the chronicity of the process. Another factor is the vascular changes which, in the form of enteritis obliterans, often cause complete closure of the vessels. When there is penetration of the ulcer into the pancreas all possibility of healing is generally gone.

From the specimens studied no determination of the primary etiology could be inferred, but the author believes that the influence of the gastric secretions on the tissues of the stomach wall has been greatly overestimated. Moreover he does not agree with the generalizations of the neurogenetic theory of the origin of gastric ulcer. The contraction of the greater curvature opposite the ulcer which is observed in the X-ray picture he regards, not as a simple spastic contracture, but as a disturbance of co-ordination between the different muscle systems of the stomach.

The presence of changes in the gastric mucosa due to gastritis is of importance as regards the intermittent attacks of pain in cases of gastric ulcer.

In order that resection in the inflamed area may be avoided the author advises against operating at the level of the pain. In cases of deep chronic ulcer of the stomach internal therapy and gastro-enterostomy will both fail. In cases of small and high ulcer Notzel's suggestion of loosening the ulcer from the posterior wall of the abdomen and then performing a gastro-enterostomy may be tried.

Of the resection methods the median resection of Riedel gives the best physiological relations but not infrequently there is a recurrence. The Billroth II resection and its modifications constitute the most radical method, but final judgment of its efficiency is not yet possible. Gastro-enterostomy is no more a cure-all in this condition than resection.

KONJETZNY (Z).

Fowler, W. F.: *Benign Gastric Ulcer in a Known Syphilitic: A Résumé of the Literature Concerning the Diagnosis of Organic Gastric Syphilis*. *Surg., Gynec. & Obst.*, 1921, xxxii, 419.

Organic gastric syphilis has been found to be more frequent than was formerly supposed. The gross lesions are gummata in various forms and diffuse infiltration. Specific ulcers result from degeneration of gummata. Symptomatically such lesions differ from benign ulcers chiefly in the absence of pain, ease following the ingestion of food and alkalies, their less marked periodicity, anacidity, vomiting associated with a good appetite, excessive weight loss, and the improvement in gastric function following specific treatment.

Without operation the diagnosis usually rests upon a history of early syphilis, present late signs of syphilis, a positive Wassermann reaction, and a positive therapeutic test. However, a negative Wassermann reaction does not exclude gastric syphilis, and benign lesions of the stomach may be present in a patient known to have syphilis.

At operation specific ulcers are always found as multiple, ragged lesions. They are usually situated at the cardia, the lesser curvature, or the pyloric region and are often associated with perigastric adhesions, thickening of the gastric walls, and gastric deformity. Large gummatous tumor masses or cicatricial contractions subsequent to extensive ulceration simulate carcinoma, particularly as regards the type of dyspepsia, the vomiting, the rapid weight loss, and the anacidity, although the cachexia and loss of strength are less than that of malignancy and the course of the condition may be longer.

The operative findings consist usually of an irremovable gastric tumor mass which is indistinguishable from carcinoma. The X-ray evidence also simulates that of carcinoma. The roentgenographic signs of organic gastric syphilis in general consist of encroachments upon the lumen, distortions, and deformities. The microscopic evidence consists of the characteristic syphilitic obliterative endarteritis and perithelial lymphocytic infiltration with atrophy of the mucous membrane and hypertrophy

of the submucosa and muscularis. Postmortem confirmation of the diagnosis is infrequent.

H. A. McKNIGHT, M.D.

Henry, C. K. P.: Recurrent Gastric Perforations.
Surg., Gynec. & Obst., 1921, xxxii, 542.

The author reports a case in which gastric perforation occurred five times. The patient, a man aged 36, was admitted to the hospital in February, 1913, with the symptoms and signs of acute gastric perforation. Prompt operation revealed a large recent perforation on the anterior surface of the stomach, 2 in. from the pylorus. The edges of the ulcer were closed, and a silk suture was used to cover it in. An anterior gastro-enterostomy was performed, the stoma being placed below and distal to the perforation. The patient left the hospital in good condition.

Six months later, in August, 1913, he was admitted to the same service with a second perforation $\frac{1}{8}$ in. in diameter in the anterior surface of the jejunum opposite the gastro-enterostomy opening. Within the ulcer the silk suture was found. The ulcer was turned in with two linen sutures. The patient again left the hospital free from symptoms.

Two years and two months later, October, 1915, he was admitted to the same hospital, but a different service. At this time there was a perforation distal to the scar of the second perforation in the jejunum. The opening was readily closed and a silk peritoneal suture was used.

The fourth perforation occurred in another city where the patient was successfully operated upon in August, 1917. The site of the perforation is unknown to the author.

The fifth perforation occurred in December, 1917. The patient was admitted to the hospital at which his first operation was performed. This perforation was preceded for one month by gastric symptoms. Immediate operation by the author revealed it in the middle of a large calloused ulcer, 15 mm. in diameter, situated at the central anterior part of the gastro-enterostomy. The ulcer was excised and the incision carried up into stomach and down into the bowel. The opening was then closed in the reverse way with three layers of suturing, one of chromic catgut and two of linen thread. In this manner a larger opening was formed and old scar tissue was removed. The proximal loop of the jejunum was sutured to the stomach wall to prevent kinking at the anastomosis.

The pathologic report was "chronic ulcer, no malignancy." An X-ray examination with the bismuth meal in January, 1918, showed that the gastro-enterostomy opening was functioning, but the emptying time of the stomach was prolonged.

In August, 1918, the patient had no symptoms and was gaining weight. In October, 1920, he reported that he was still without symptoms.

The author concludes that this case shows the importance of silk and linen suture material in the causation of recurrent perforations.

G. HAVEN MANKIN, M.D.

Straeuli, A.: The Treatment of Perforated Gastric Ulcer (Zur Therapie des Ulcus ventriculi perforatum). *Schweiz. med. Wchnschr.*, 1921, li, 443.

The author reports two cases in which recovery resulted after suture of the point of perforation, primary gastro-enterostomy, and lavage of the abdominal cavity. Following these reports he gives a brief review of all cases of ulcer perforation which occurred in a hospital since 1896. In 11 cases primary anastomosis was added to suturing and lavage of the abdominal cavity. In 1 case the excision of the ulcer was necessary because of failure of the Lembert sutures to hold.

The total mortality was 41.2 per cent. Among the cases operated upon in the first six hours there were no deaths, while among those operated upon in the next six hours the mortality was 22 per cent and among those operated upon between the nineteenth and twenty-fourth hours it was 50 per cent. When the operation was performed after a period of twenty-four hours there were no recoveries. The onset of symptoms is without exception accompanied by such severe pain that the time elapsed since the onset is often given to the minute. Cases cited in the literature in which recovery resulted after more than twenty-four hours had elapsed between the onset of symptoms and operation were most probably instances of so-called "covered" perforation. The total mortality figures quoted by the author strike a mean between the corresponding figures given in the literature. In one case the operation was undertaken one and three-fourths hours after the perforation had occurred.

After twelve hours those symptoms so characteristic in the beginning begin to disappear. Of great importance in the diagnosis is a carefully taken history. All the patients whose cases are reviewed had suffered gastric distress for longer or shorter periods of time, but often the periodically recurring pains were not taken for gastric pain. Definite pain is not necessarily associated with the picture of gastric ulcer. A number of patients go about for years with back pains without knowing that they have stomach trouble. The onset of pain is always very sudden; on the other hand, it is not generally known that in many cases the pain does not remain at the original level, and that even when no drugs are given to relieve pain there may be subjective improvement. Probably this subjective improvement is related to local reparative processes.

In the differential diagnosis appendicitis must be given chief consideration, especially since in perforated ulcer the pain on pressure is often referred to the ileocecal region. Moreover, in both conditions the initial pain may be referred to the upper quadrant of the abdomen. The most important point characteristic of perforation is the board-like rigidity of the abdominal wall. If an exact diagnosis cannot be made the misfortune is not so great provided the symptoms indicate immediate operative interference without loss of time.

SCHUBERT (Z).

Borchers, E.: The Participation of the Vagus Nerve in the Motor Innervation of the Stomach with Reference to the Operative Treatment of Diseases of the Stomach: Studies on the Physiology and Pathology of Gastric Motility and Modern Problems of Gastric Surgery (Anteil des Nervus vagus an der motorischen Innervation des Magens im Hinblick auf die operative Therapie von Magenkrankheiten. Studien zur Physiologie und Pathologie der Magenbewegungen, sowie zu modernen Problemen der Magen Chirurgie). *Beitr. z. klin. Chir.*, 1921, cxvii, 547.

In spite of the numerous articles which have been written on the physiology of the innervation of the stomach, the function of the vagus nerve is still not clearly understood. Some authors believe that this nerve has little or no influence on the movements of the stomach while others regard it as the main nerve governing gastric motility. The author attempted to answer this important question by a series of experiments on cats.

Borchers discusses first the important points in the anatomy and physiology of the stomach. By observations through gastric fistulae he proved that the form and movement of the stomach under the influence of barium are exactly the same as when ordinary food is taken.

When the vagus innervation of the stomach of the cat was not disturbed, the emptying time averaged about two and one-half hours, a finding which agreed exactly with that made in cats not operated upon which were placed in front of the fluoroscopic screen after the stomach was filled with contrast material. Peristalsis in the form of ring-like contractions progressing toward the pylorus began a few minutes after the ingestion of the meal. These waves appeared first in the center of the stomach and then became more distinct at the borders of the upper and middle thirds. At first they were shallow but gradually became deeper. Often the motion ceased. The gastric motility therefore was periodic but there was no regularity in the phases of movement. The frequency of the wave was usually about three or four a minute. With this wave-like peristalsis toward the pylorus there was formed intermittently a particularly sharp constricting wave in the region between the ventricular sinus and the beginning of the pylorus—a deep ring-like groove which cut off the main portion of the stomach from the filled pyloric portion. The pyloric portion then contracted concentrically and forced its contents into the duodenum.

Gurgling in the stomach was noted: (1) when stomach contents mixed with gas were discharged; (2) when a sharply constricting peristaltic wave forced the gastric contents against the closed pylorus, the constriction forcing it back again into the stomach; and (3) when, following too early closure, the partition above was forced open by the still-increasing expressive force. From these facts it is evident that gurgling is not pathognomonic of strictures but may be present also when there is occlusion.

Summing up his observations gained by studying the stomach through fistulae, the author comes to the conclusion that, on the basis of its function, the stomach consists of two parts, a digestive sac and an evacuation sac. The evacuation sac, however, has a part in the mixing of the stomach contents.

When the action of the vagus nerve on the gastric musculature was blocked by bilateral section in the region of the cardia it was found that during the first few days there was a slowing down and an irregularity in the gastric motility, but after five days the evacuation again became practically normal. Moreover, under such conditions there were variations in the tonicity of the stomach and a regional spasm persisting for some time. Following transverse section of the stomach at varying levels the motility was not disturbed in any way and there was no decrease in the tonicity of the muscle. The pylorus was always found closed. Longitudinal, lateral, and combined pendulum movements of the stomach were noted although they were less distinct than in the intestines.

Antiperistalsis may also be present in the stomach and appears to be pathognomonic of stenosis. As regards vomiting it was noted that antiperistaltic movement of the stomach was absent; the gastric contents were forced through the open cardia by abdominal pressure. Whether there was some other active participation of the gastric musculature could not be determined from the observations.

When the stomach was resected transversely and the two parts were joined again by suture at the juncture of the lower and middle thirds, each portion of the stomach showed a definite peristalsis which was entirely independent from that in the other portion. From this it appears that gastric peristalsis may originate from local stimulation of the gastric mucosa without participation of the vagus. Moreover, intense pyloric spasm may occur in the stomach without a vagus nerve. Therefore, the theory that the nerve plexus in the stomach wall is stimulated through the vagus was not confirmed in these experiments.

An attempt to cause spasm by electrical stimulation of the vagus in the region of a lesion of the mucosa failed completely. Bilateral stimulation of the cervical vagi also had no influence upon the movements of the stomach. However, electrical stimulation of the cervical vagi caused an immediate contraction of the musculature of the lower portion of the oesophagus but the cardia became relaxed after five or ten seconds. If the vagus was blocked there was no reaction when the cervical vagi were stimulated and no spasm such as would have occurred otherwise followed injury of the mucosa.

Blocking of the von Openchowski ganglion in patients operated upon under local anaesthesia had no effect upon an existing cardiospasm. Neither did blocking of the sympathetic nerves by anaesthesia of the coeliac plexus have any effect. Therefore neither the sympathetic nerves nor von Open-

chowski's ganglion has any influence upon the spasticity of the cardia and it is to be assumed that the nerve elements of the cardial wall are themselves responsible both for the normal closure of the cardia and for cardiospasm.

The disturbances of gastric motility observed in hysteria, neurasthenia, tetanus, and lead poisoning are dependent upon increased irritability of the gastric mucosa to every form of irritation and this is only a phase of increased irritability of the entire nervous system. Regarding the development of gastric ulcers the author comes to the conclusion that the part played by the vagus is very unimportant.

The intravenous administration of pylorcarpine causes spasm both when the stomach is normal and when the vagus is blocked. Therefore, the point of attack of the pilocarpine is to be sought in the peripheral plexus of the stomach wall or the muscle fibers themselves.

According to the results of the author's experiments a favorable effect upon the gastric crises in tabes cannot be expected from the subdiaphragmatic blocking of the vagus nerve recommended by Exner. Moreover, the extramucosal circumcision suggested by Stierlin will not cause insufficiency of the pylorus and thereby quicken the emptying of the stomach in cases of ulcer.

Borchers concludes his article with the statement that according to all his observations the vagus nerve is not the motor nerve of the stomach and that a favorable effect upon disturbances of the motility of the stomach, the cardia, and the pylorus cannot be expected from surgical interruption of the vagus or similar methods.

BODE (Z).

Bell, G.: Resection of the Small Intestine for War Wounds. *J. Roy. Army Med. Corps.*, Lond., 1921, xxxvi, 351.

The author had extensive experience in the surgery of war wounds of the intestine while serving for three years at a casualty clearing station on the British front in France. While as a rule it is wise to avoid intestinal resection when suture is possible, he is of the opinion that certain general indications for resection may be set forth: (1) complete division of the gut at one or several points such as frequently occurred in machine gun or rifle bullet wounds; (2) multiple wounds riddling a section of bowel, especially when the lesions affect the mesenteric border; (3) damage to the mesentery of such extent as to endanger the vitality of the gut; (4) obvious gangrene of a damaged area—a rare occurrence; (5) severe multiple holing involving possibly a considerable length of gut, necessitating much time in repair, and apt to leave the restored part low in vitality and unable to resume its function. The latter is the class of case in which there was most apt to be a difference of opinion as to the best line of treatment.

Undoubtedly the strongest argument against resection is the amount of shock produced, and every care must be taken to guard against it by maintain-

ing body warmth, the use of large incisions to reduce manipulation and evisceration to a minimum, and speedy, yet thorough operating. The author emphasizes the importance of emptying the gut of its contents above and below the perforation. It was his custom to make an end-to-end anastomosis with two layers of continuous silk sutures. Simple mopping out of the peritoneal cavity was done instead of copious lavage. Except for the insertion of a drain down to a local septic focus or to the vicinity of a dubious suture line in the colon, the laparotomy wound was closed completely without drainage after careful cleansing of the abdominal cavity. The author states that these remarks on drainage apply only to the cases under consideration and not to certain aspects of abdominal surgery in civil practice.

Purgatives were avoided unless distention appeared. If then there was sufficient cause for distress, a turpentine enema was given and repeated if necessary. This was followed on the fourth or fifth day by castor oil supplemented sometimes by pituitrin given intramuscularly. Vomiting was treated by lavage. Rectal saline was given as a routine. Bell is convinced that generous doses of morphine, at least before the operation, did much more good than harm. In one case $6\frac{1}{4}$ ft. of gut were resected. It was a striking fact that in cases requiring extensive resection there was little more shock from the operation *per se* than in those in which a short length of gut was removed.

Lateral anastomosis was occasionally employed as when an extensive resection leaving two grossly unequal ends of bowel was necessary, when considerable peritonitis was present and the upper reaches of the gut showed marked distention and seemed apt to become paralyzed, and when a resection of considerable extent was done in the lower ileum. The mortality of gunshot wounds of the small intestine subjected to operation and requiring resection will be about 50 per cent. In uncomplicated cases it may fall, under very favorable circumstances, to 25 per cent. Hemorrhage is the most important factor causing a heavy primary mortality. Blood transfusion is of the greatest value as a life saving measure in desperate cases.

FREDERICK CHRISTOPHER, M.D.

Bode: Stenosis of the Duodenum Resulting from the Formation of Periduodenal Adhesions (Duodenalstenosen infolge periduodenitischer Adhäsionsbildungen). *Beitr. z. klin. Chir.*, 1921, cxxii, 623.

There are two types of duodenal stenosis. (1) those which are the result of scar-tissue contraction and spasm due to ulcer, and (2) those which, without any organic involvement of the wall of the intestine, are caused by periduodenal adhesions of duodenal or other origin. The latter type are not at all rare.

The upper peritoneal portion of the duodenum is movable and follows the movements of the

stomach in its varying degrees of filling. Adhesions which hinder this movability call forth pathologic phenomena such as pain accompanying the changes in the filling of the stomach.

Adhesions to the lower surface of the liver and where it lies over the psoas muscle cause in the X-ray picture a distinct abnormal filling of the duodenal bulb when there is pyloric insufficiency. The resulting stasis of the acid stomach contents in the first portion of the duodenum may lead to secondary ulcer formation in this region.

Besides adhesions of the duodenum to the under surface of the liver just back of the pylorus there may be adhesions between the transition area from the upper to the lower portions of the duodenum and the gall-bladder, bile passages, or colon, which cause an hourglass-shaped double stenosis with the formation of a false diverticulum. If the lower parts of the gall-bladder and the cystic duct are involved in the adhesions, symptoms resembling those of cholelithiasis may be added to those of the duodenal stenosis. The subjective symptoms consist of pain following the ingestion of food and lasting until the stomach is empty. Hunger pain is absent. Examination revealed pain on pressure. The emptying of the stomach is delayed in the presence of normal motility. The gastric secretion findings vary; often acidity is lowered. The stimulation of the secretion of gastric juice by the chyme is opposed by an inhibitory influence arising from the mucous membrane of the duodenum which is associated with the process of fat resorption. This influence becomes more pronounced in stasis of the duodenum, is less pronounced when foods poor in fats are ingested, and is absent when gastro-enterostomy, especially with exclusion of the pylorus, is done. This perhaps explains the tendency to the development of peptic ulcer following long-continued stasis of hydrochloric acid.

The formation of such adhesions should be prevented, therefore, in all operations in this region. After surgical loosening of adhesions their formation anew must be prevented by careful peritonization. Gastro-enterostomy is not justified. HELLER (Z).

Lewis, R. M.: Cancer of the Ampulla of Vater. *Surg., Gynec. & Obst.*, 1921, xxxii, 543.

The return of a patient to the clinic for observation eight and a half years after successful radical extirpation of a cancer of the ampulla by Kelly and Burnam prompted the author to review the literature on the subject.

Not many such cases have been reported. There are records of only 16 in which radical resection was done and in only 3 reports was it definitely stated that the patient was well over a year after the operation. It is remarked that on account of the peculiar site of these growths the diagnosis of a condition calling for operation can be, and is, made earlier than in cases of any form of internal cancer. They give rise to symptoms very early and metastasize late.

Most of the primary tumors of the ampulla appear to be adenocarcinomata. They may originate from the common bile duct, the duodenum, or either of the pancreatic ducts.

A positive diagnosis is rarely made in cases of cancer of the ampulla before the abdomen is open. The cardinal symptoms are, first, icterus; second, chronic constipation; and third, distention of the gall-bladder. Pain is frequently felt in the region of the gall-bladder. Fever and colic are rarely present.

With respect to operative measures the author states that the best and simplest palliative procedure is a cholecystenterostomy with or without a gastro-enterostomy. The best type of radical operation for a particular case depends on the extent of the disease and the patient's condition. If the patient is profoundly jaundiced and too ill to stand resection, it is the part of wisdom to do a preliminary cholecyst-jejunostomy, delaying resection of the tumor until a later and safer time. When the case is favorable and early, transduodenal approach and excision are the most satisfactory. This was the method employed in the case reported.

This case at operation showed a distended gall-bladder. There were no stones in the gall-bladder or the cystic or common ducts. The stomach and duodenum were normal. The common duct was dilated. On examination of its distal end a hard nodule the size of a bean was discovered through the duodenum at the site of the ampulla. The duct was opened and explored but no stone was found. The duodenum was opened by an incision opposite the mass, and an incision was made about the nodule in the posterior duodenal wall. The nodule and bile duct were pulled forward into the gut and divided well above the growth. The common duct was then fixed to the wall of the duodenum with catgut sutures. The opening first made in the duodenum was closed and finally the gall-bladder was drained. A cigarette drain was put down also to the closed incision in the common bile duct.

During the eight weeks following the operation the patient made an uneventful recovery. The microscopic examination showed a typical adenocarcinoma of the ampulla of Vater.

G. HAVEN MANKIN, M.D.

Levy, E.: Congenital Atresia of the Ileum (Kongenitale Atresie des Ileum). *Zentralbl. f. Gynaek.*, 1921, xlv, 707.

A laparotomy was performed on an infant three days old because of constant vomiting of greenish-colored fluid and the absence of meconium which suggested obstruction of the bowel at the juncture of the median and distal thirds of the ileum. Atresia of the small intestine was found. Above the area of atresia the intestine was hypertrophic for some distance, while below that point it was scarcely as thick as a lead pencil and with its mesentery was atrophic and pale.

An entero-anastomosis was effected. The child died fifteen hours later. As subsequent examination

revealed hardened, dried meconium in the large intestine, the author concludes that the atresia resulted from stenosis caused by the obliterated omphalomesenteric duct. SIMON (Z).

Brun: Ileocæcal Tuberculosis; Ileotransverse Side-to-Side Anastomosis; Intestinal Stasis Above and Below the Anastomosis; Ileocolectomy and End-to-End Ileotransverse Suture; Recovery (Tuberculose iléo-caecale; anastomose iléo-transverse latéro-latérale; stase intestinale en amont et en aval de l'anastomose; iléocolectomie et suture iléotransverse termino-terminale; guérison). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 793.

In the case of a man 33 years of age an ileotransversostomy was performed for a cæcal tumor. As intestinal pain recurred after seven or eight months he was again operated upon. In the second operation an enormous intestinal stricture was found in the region of the side-to-side ileotransverse anastomosis which had been formed at the first operation. Above the anastomosis for about 75 cm. the small intestine was dilated, while below it there was extensive dilatation as far as the ileocæcal valve. The cæcum showed typical hypertrophic tuberculosis.

Brun sectioned the small intestine at 75 cm. from the anastomosis, cutting transversely above it. He then removed the dilated intestine, the ileocolic anastomoses, and the entire right colon and re-established the continuity of the intestinal tract by an end-to-end transverse ileocolostomy on the left side. The patient made a perfect recovery.

Ileocolic side-to-side anastomosis is a poor operation as it exposes the patient to colic reflux and thus to ileal stasis. End-to-side ileocolic anastomosis, i.e., the unilateral exclusion of the atresic segment of the colon, is preferable but also favors colic reflux. Even if the anastomosis is made close to the ileocolic valve the neostomy is exposed to invasion by the progressive lesions in the colon. Under all circumstances the best procedure is transverse end-to-end ileocolostomy with section of the small intestine close to the valve and the insertion of the end of the ileum as near as possible to the lower limit of the colic stenosis. W. A. BRENNAN.

Stone, H. B.: The Toxic Agents Developed in the Course of Acute Intestinal Obstruction and Their Action. *Surg., Gynec. & Obst.*, 1921, xxxii, 415.

The author reviews the various theories evolved to explain why acute intestinal obstruction is such a highly dangerous and often fatal condition. He refers to the experiments of Whipple, Bernheim, and Stone in which it was found that in dogs with obstructed loops of bowel death was caused directly by intoxication and was not dependent upon nervous disturbances, circulatory obstruction, or desiccation. When the toxic material found in obstructed loops was injected with proper technique into normal dogs, it caused death with the symptoms noted when the bowel itself was obstructed. On the other

hand, when it was introduced into the normal unobstructed bowel it was apparently not absorbed.

Various explanations of what happens in obstruction of the bowel to cause absorption have been advanced, but none has been generally accepted. The author suggests that absorption of the toxins does occur in the normal bowel but that the first of this material produces the effect noted following experimental injection of the toxins, namely, increased tone and peristalsis of the gastro-intestinal musculature. In the normal open gut this increased peristalsis hurries the bulk of the toxic material along so that not enough of it is absorbed to cause serious symptoms. In the obstructed gut, vomiting and increased peristalsis result from the same cause, but the mass of the toxin is not thereby removed. Instead, stasis of the bowel leads to the formation of more and more toxin and an increasingly greater amount is absorbed until symptomatic and finally lethal effects result. The article is summarized as follows:

The following facts concerning acute intestinal obstruction may be stated as generally believed: (1) the cause of death in acute intestinal obstruction is a form of chemical intoxication; (2) the toxic chemicals are developed in the process of protein disintegration; (3) the effect of these toxic chemicals is a fall in the blood pressure, temperature disturbances, vomiting, diarrhœa, disturbances of kidney excretion, high non-protein blood nitrogen, delayed coagulation time of the blood, profound congestion of the duodenal and jejunal mucosa, collapse, and death. The following points are in dispute: (1) the precise chemical nature of the chief toxic factors; (2) the precise cause of the protein disintegration which results in toxin production; (3) the precise mechanism of absorption.

The clinical surgeon may derive from all of this experimental investigation the following practical suggestions: (1) a confirmation and scientific reason for the belief previously held that prompt relief of the obstruction and evacuation of the contents of the obstructed bowel are essential; (2) the use of the non-protein nitrogen content of the blood as a pre-operative guide to the degree of intoxication and a postoperative guide to the prognosis; and (3) the postoperative use of all measures which combat severe chemical poisoning, viz., the introduction of fluid into the system, the use of heat, washing of the stomach and lower bowel, and possibly an enterostomy opening. FREDERICK CHRISTOPHER, M.D.

Brunner, F.: The Indications for Enterostomy and Its Technique (Ueber Indikation und Technik der Enterostomie). *Schweiz. med. Wchnschr.*, 1921, li, 426.

Occasionally enterostomy may be beneficial in severe conditions resembling ileus, but only when there is some local obstruction to peristalsis. In diffuse peritonitis it is useless.

In 10 cured cases a local obstruction was found but there was no peritonitis. In 7 of these cases

an appendectomy had been performed. As a result of the enterostomy the bowel collapsed, the valve-like obstruction was opened, and the intestine again became patent. Of the 24 fatal cases there were 13 with diffuse peritonitis.

Since peritonitis cannot always be excluded clinically, an operation should be performed even in doubtful cases. A second laparotomy, which is indicated in true ileus, is often too dangerous for the weakened patient; moreover, it is contra-indicated when a collection of pus still remains in the abdomen (appendicitis).

Enterostomy should not be too long delayed. The formation of a Witzel fistula is an unnecessary complication and because of the possibility of obstruction of the tube is not a good method. As a rule the enterostomy closes spontaneously in about fifteen days. The technique is as follows:

In cases of generalized tympanitis a longitudinal incision is made under local anæsthesia through the rectus muscle on the left side below the umbilicus and the peritoneum is opened for a distance of about 2 or 3 cm. When the distention is localized, the opening is made in this area, but when possible, through a layer of muscle. The distended intestine is sutured, water-tight, to the peritoneum and at once opened for a distance of 8 to 10 cm., a short drainage tube being inserted.

In several operations performed one year later it was found that the bowel had spontaneously loosened itself from the abdominal wall. When the fistula persists its operative closure offers no difficulties.

SCHUBERT (Z).

Jonas, A. F.: Undescended Cæcum and Vermiform Appendix: Report of Cases. *J. Am. M. Ass.*, 1921, lxxvi, 1821.

The author reports in detail two cases of suppurative appendicitis with an unusual location of the appendix. In early intra-uterine life the cæcum is placed immediately below the liver and at about the sixth month it begins to descend into the right iliac fossa. In the two cases reported it would seem that the cæcum failed to descend from its site beneath the liver and hence the abnormally misplaced appendix. Of course the appendix may be found in any part of the abdomen but as a rule these cases are associated with a mobile cæcum and are not true cases of undescended vermiform appendix. A very interesting phenomenon in the cases reported was the discovery of a point of tenderness in the right iliac fossa. Pottenger tells us that "no matter where the appendix lies, whether it be in the left side of the body or in the right side, or whether it be high or low in the abdomen, the natural place for the pain is in the right lower quadrant."

The first case reported was that of a corpulent woman, aged 45, who had suffered from severe pain in the right abdomen for three days. Attempts at catharsis and relief of pain failed. She complained constantly of pain which she located chiefly in the right hypochondrium. Her knees were drawn

up, her breathing was shallow, her pulse rapid (130), and her temperature 103° F. The abdominal muscles on the right side were rigid and tender, especially near the costal margin. The symptoms seemed to point to a gall-bladder or duodenal lesion or an acute angulation. Surgical interference was objected to and the patient died two days later. At autopsy no cæcum was found in the right iliac fossa and as search proceeded upward extensive adhesions were encountered especially in the right hypochondrium; when these were broken through, a large foetid abscess was found. The cavity extended high up under the liver. On its inner side was the duodenum. Its base was composed of the cæcum and omentum. The gangrenous appendix lay in the cavity itself.

The second case was that of a farmer, aged 40, who had had pain in the right side of the abdomen for one week. This pain was preceded by vomiting and at first was restricted to the peri-umbilical region. Later it became localized in the right side and extended upward to the costal margin. The picture was that of an acute surgical abdomen with intense pain and tenderness in the right hypochondrium. At operation a high right rectus incision led into a large abscess containing foetid pus. Exploration brought to view a rather long, perforated appendix. This was removed. The cæcum, which then came into view, seemed to form the lower wall of the abscess.

LOUIS HANDELMAN, M.D.

Bosch-Arana, G.: Encysted Appendicular Pelvic Abscess and Its Treatment by the Rectal Route by a Specially Designed Twin Drain
El absceso pélvico enquistado apendicular y su tratamiento por vía rectal con dren gemeler modelo original). *Semana méd.*, 1921, xxviii, 569.

Encysted primary closed pelvic abscess of appendicular origin is rare. Its formation depends upon close relationship of the appendix to Douglas' sac or a lymphangitis of appendicular origin. The symptoms suggest renal colic or acute colitis. The four cardinal symptoms are hypogastric pain, painful polakuria, pains in the lumbar region, and intestinal colic with frequent desire to defæcate. The most definite information, however, is derived from rectal palpation and rectoscopy. When such a pelvic process is diagnosed operation should be performed immediately as there is nothing to be gained by temporizing.

Some surgeons approach a pelvic encysted abscess by the high route, either the perineal, the rectal, or the vaginal. Bosch-Arana believes the rectal route is much superior to the others despite the danger of re-infection of the rectal cavity from the abscess cavity. In his opinion the anatomical difficulties of drainage render the high route dangerous because of the risk of generalized peritonitis which developed in certain cases operated on by this route and reported in the literature. In deep pelvic abscesses operation by the high route usually exposes the patient to grave risks. If a surgical complication develops in the pelvis consecutive to an iliac abscess drained by the high route we cannot

drain it by the same route and must do so by the lower route. Rectal drainage is of advantage also because it drains from the lowest point.

In males the pre-rectal and rectal routes are usually chosen, the former being preferable because it is less septic. In the female the vaginal routes are practical, but Bosch-Arana believes that the rectal route is better than the pre-rectal or vaginal route as it does not necessitate much cutting into healthy tissue and there is less danger of infection and fistulization. The danger of secondary re-infection of the abscess focus consecutive to an operation to drain the focus through the rectal cavity has been disproved by the author's experience as well as that of others. It has been found also that the abdominal pressure causes rapid evacuation of the abscess through this route.

Only a small incision is made in the anterior wall of the rectum. This rectotomy is much simpler than other means of evacuating a deep pelvic abscess. The abscess is located by an exploratory puncture through the anterior rectal wall which is then incised horizontally to avoid section of the hæmorrhoidal arteries which run on both sides of the rectum. Drainage is effected by special twin drainage tubes of rubber designed by the author which he calls respectively the "injector" and the "expeller." The abscess cavity is drained through four orifices in the extremity of the injector. The expelling tube has several openings in its sides and one at its extremity. Antiseptic lavage of the cavity is effected through the terminal orifice of this tube.

The tubes fulfill the double function of draining the abscess cavity and evacuating gases and fæcal matter. When the purulent abscess cavity has been flushed and cleaned the same arrangement of tubes permits lavage of the rectal cavity. For such lavage a forceps is placed on the lower end of the expelling tube. The antiseptic fluid, injected through the other tube, is forced out from the abscess cavity through the longitudinal holes in the expelling tube into the rectal cavity. The fluid is then drained by removing the forceps.

The treatments, which are entirely painless, are repeated two or three times each day and the tubes are not disturbed for five days or a week. There is practically no operative mortality. One of Bosch-Arana's patients left the hospital completely cured fourteen days after operation. The difference in the time of recovery following this method and that following the use of the abdominal route varies from twenty to thirty days.

W. A. BRENNAN.

Staffel, E.: Experiences with Parasacral Anæsthesia Especially in Amputation and Resection of the Rectum (Erfahrungen mit der parasakralen Anæsthesie, besonders bei der Mastdarmamputation und -resektion). *Zentralbl. f. Chir.*, 1921, xlviii, 729.

Since 1912, parasacral anæsthesia has been the method of choice in the Zwickau hospital for all perineal and vaginal operations. Extirpation of the uterus, operations for prolapse, vagino-in-

testinal plastic operations, urethrotomies, and operations for cancer of the rectum have been carried out with this method almost altogether. Moreover, it has been found of value for all bladder operations, even suprapubic prostatectomies, but in these procedures the abdominal incision also is infiltrated. In cases of hæmorrhoids, fissures, and simple rectal fistulæ simple circuminfiltration gives equally good results. For the treatment of deep and multiple rectal fistulæ a general anæsthetic is advisable as the parasacral infiltration would involve infected tissue.

By the simple, familiar technique, the sacral foramina are filled with $\frac{1}{2}$ per cent novocaine-adrenalin solution and the sacral plexus, together with the corresponding sympathetic nerves, is blocked. The tapping of the individual foramina with the needle is not necessary, the sensation of contact of the needle point with the bone being sufficient. The two lateral injections are made near the coccyx in order to avoid injuring the rectum. In operations upon the perineum and anus the plexus coccygeus must be blocked by circuminjection of the coccyx and the operative field injected subcutaneously. When a serious operation is to be performed the patient is prepared with morphine and scopolamine.

In the nine years parasacral anæsthesia has been used in 413 cases. In only 18 instances was total exclusion of the sacral plexus not obtained. No unfavorable by-effects or after-effects were noted.

Parasacral anæsthesia surpasses both epidural and lumbar anæsthesia as to certainty of results and safety. It surpasses the former also in simplicity of technique, and the latter in duration of anæsthetic effect. Of 65 cases of carcinoma of the rectum operated upon by the sacral route parasacral anæsthesia was used in 56, general anæsthesia in 8, and lumbar anæsthesia in 1. Fifty-two of the operations performed under parasacral anæsthesia were amputations and 4 were sacral resections. In 2, the method failed; in 3, general anæsthesia was necessary in the course of the operation; and in 51 the method was successful. In sacral resections the skin incision must be infiltrated in addition. Even when the rectum is separated as far as the sigmoid flexure and brought down, the patient seldom complains of pain. There have been no operative deaths. As in cases of gastric operations, the patient comes from the operating table in much better condition than he would if operated upon under general anæsthesia.

TOELKEN (Z).

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

MacCarty, W. C., and Jackson, A.: The Relation of Hepatitis to Cholecystitis. *Minnesota Med.*, 1921, iv, 377.

In 1910 MacCarty emphasized the close anatomical, physiological, and pathological relationship of disease conditions of the stomach, duodenum, gall-

bladder, liver, and pancreas, and described the physiology of the gastro-duodeno-hepato-pancreatic system. As the pathologic and clinical facts led to the conception of a possible pathologic relationship and sequence, a study was made of specimens removed from the liver in 58 cases of cholecystitis.

A similar study was made in 1918 by Graham who reported in detail 8 of a series of 30 cases of acute cholecystitis and hepatitis. Eighty-seven per cent of his series of patients with cholecystitis had enlarged livers.

Ninety per cent of the gall-bladders operated on at the Mayo Clinic are chronically inflamed; in a series of 4,824 gall-bladders, 4,430 (91.9 per cent) were chronically diseased. In a series of 58 cases studied in relation to hepatitis 81 per cent showed chronic inflammation. The liver was studied independently of the condition of the gall-bladder. The specimens represented portions of the liver near the gall-bladder and also portions some distance away from it.

The nature of the inflammatory reaction in the liver is summarized by the statement that it consists of periductal lymphocytic infiltration and fibrosis, both processes sometimes extending between the columns of liver cells which are occasionally atrophic, vacuolated, or distorted. Extracellular and intracellular pigment is occasionally present, and small bile ducts are sometimes partially destroyed. The reaction in the liver varies in amount, the degree apparently bearing no direct relationship to the degree of reaction in the gall-bladder. Such a condition remaining in the liver after cholecystectomy or cholecystostomy might explain, at least in part, the fact that following these operations some patients continue to have trouble similar to their pre-operative attacks.

In conclusion the authors state that chronic cholecystitis is very frequently, if not always, associated with chronic hepatitis. This fact suggests that the general obscure symptoms which frequently occur with cholecystitis may have their origin in chronic disturbances of hepatic function.

A detailed report of the microscopic examination in the 58 cases studied is given. IRA SISK, M.D.

McMaster, P. D., and Rous, P.: The Biliary Obstruction Required to Produce Jaundice. *J. Exper. M.*, 1921, xxxiii, 731.

The authors state that in a recent paper on the same subject observations were reported proving that a part of the rabbit's liver can function for the whole as regards bile elimination. A good instance in point was furnished by an experiment performed by them with another end in view. In a series of rabbits the ducts from three-fourths of the hepatic tissue and the portal branch to the remaining fourth were ligated so that the portal flow and also the bile formation in the mass with the obstructed ducts were increased. Under such circumstances the entire burden of bile elimination was laid on a quar-

ter of the parenchyma which was supplied with blood only by the hepatic artery, a source furnishing approximately two-fifths of the normal quantity. It was found that the rabbits remained unjaundiced and healthy. Recent observations indicate that the same experiment would yield a similar result in dogs.

The authors' state that in a search of the literature they were surprised to find no general recognition of the large margin of safety on the part of the liver in bile elimination. On the contrary, frequent categorical statements are made to the effect that, in man at least, jaundice is often caused by lesions affecting only a small part of the hepatic parenchyma. However, the divergence of opinion on this subject is obviously the result, first, of a lack of experimental evidence regarding the essential point at issue—the ability of a part of the liver to act for the whole in bile elimination—and, second, of conclusions drawn from clinical cases complicated by many factors.

In the investigation reported in this article dogs and monkeys were used. Rabbits could not be employed because their bile pigment fails to react satisfactorily to the ordinary tests. From these experiments the following conclusions are drawn:

The bile ducts from three-quarters of the liver substance in dogs and monkeys can be obstructed without causing any clinical evidence of pigment or cholate accumulation in the organism. In the dog nineteen-twentieths of the liver substance can be placed in stasis without the occurrence of tissue icterus such as regularly follows total obstruction in this animal. There is no reason to suppose that this will not be found true in the monkey as well. In every instance a local obstruction results sooner or later in atrophy of the affected tissue with compensatory hypertrophy elsewhere. Thus as time passes the derangement of function produced by the sudden stasis is progressively lessened.

The plasma of the dog and the monkey, unlike that of man, is normally free from bilirubin, and this pigment so readily escapes from the blood into the urine that bilirubinuria is often to be found in the dog in the absence of bilirubinemia, while the latter never occurs alone in either animal. It follows that in both species the renal threshold for bilirubin is much lower than in man, if indeed one can be said to exist at all.

The amount of biliary obstruction necessary to produce jaundice in human beings is probably as great as in dogs and monkeys. The clinical jaundice associated with local liver lesions should be regarded as due to a general injury to the hepatic parenchyma or ducts, or to blood destruction.

GEORGE E. BEILBY, M.D.

Judd, E. S.: Surgery of the Gall-Bladder and Biliary Ducts. *J. Kansas M. Soc.*, 1921, xxi, 185.

A better knowledge is necessary regarding the etiology of cholecystitis as well as the relationship of the liver and pancreas. It is generally believed that infections in the excretory tract enter the

tissues of the gall-bladder and ducts by way of the blood stream and lymphatic vessels. Studies of the source and extent of these infections emphasize the importance of the lymphatics in this region as distributors of the infection. Graham has shown that in all cases of cholecystitis there is an associated hepatitis. Deaver and others report that certain cases of cholecystitis have an associated pancreatitis, and that the infection extends from the gall-bladder to the pancreas by way of the lymphatics. Mann, in the Mayo Clinic, has produced a specific cholecystitis by means of chemicals introduced into the blood stream. He showed that the solution gained entrance to the tissues of the gall-bladder through the blood stream, and that the reaction does not extend beyond the gall-bladder and cystic ducts.

Cholecystitis, considered clinically, is of several different types. Type 1 is characterized by a typical hepatic colic; pain which is sudden in onset and usually severe enough to require morphine occurs in the epigastrium, radiates through to the back and right shoulder, and is followed by residual soreness in the region of the gall-bladder. Type 2 is the so-called intermittent hepatic colic. Type 3 is an infection retained in the gall-bladder over a long period of time, such as commonly occurs after typhoid. Such quiescent infections may become active at intervals and cause local symptoms. Type 4 is disease of the gall-bladder associated with migraine. In a number of such cases the migraine was permanently relieved by operation. Type 5 is disease of the gall-bladder associated with changes in the cardiovascular system. It is sometimes difficult to distinguish between a gall-bladder attack and an attack due to cardiovascular disease with abdominal symptoms.

Several problems are to be considered in the treatment of diseases of the gall-bladder and biliary duct. Most cases of cholecystitis and cholangitis are surgical. In chronic cases operation may be performed at any convenient time. In cases of cholecystitis without jaundice which are seen during an attack it is usually best to wait until the attack has subsided. If a severe degree of pancreatitis is suspected, the advisability of operation is questionable.

The operation in cases of pancreatitis and fat necrosis must be performed with the least possible amount of trauma. One of the most serious problems in these complicated cases is the presence of jaundice. Operation during the time the patient is jaundiced should be avoided if possible. One of the greatest dangers is hæmorrhage. If it is necessary to operate during the presence of deep jaundice much benefit will be derived from blood transfusion before and after operation in conjunction with the intravenous administration of calcium. In many cases after operation the flow of bile following transfusion is sustained.

The question as to whether the gall-bladder should be drained or removed in cases of cholecystitis seems to settle itself. It will still be necessary to drain some

of the more severely infected gall-gladders, however, and to remove them later if this seems best. One of the greatest advances in the technique of cholecystectomy is the proof, as first reported by Willis, that it is safe to close the abdomen without drainage in the clean cases. The author believes that drainage is absolutely unnecessary in the majority of cases of cholecystectomy. In cases of choledochotomy it is better to provide the liver and duct with free drainage by inserting a small tube in the duct and suturing the opening around it accurately.

N. H. COPENHAVER, M.D.

Horgan, E. J.: Accessory Pancreatic Tissue: Report of Two Cases. *Arch. Surg.*, 1921, ii, 521.

Eighty-one cases of accessory pancreatic tissue in man have been reported in the literature. In a series of 321 consecutive autopsies at the Mayo Clinic, in 314 of which the entire length of the intestine was opened, accessory pancreases were found in 2 (0.6 per cent). In one case the aberrant tissue was in the stomach; in the other, in the duodenum. In another instance pancreatic tissue was found at operation in the jejunum 3 in. from the ligament of Treitz and it was necessary to go below it to perform a gastro-enterostomy.

Oppel believes the pancreas is found in every species of vertebrate. In man it develops from buds of the duodenum as two anlagen. In different animals the number varies. The dorsal anlage begins as an outpouching of the duodenum, and the ventral anlage as a grooved bud arising from the common bile duct at its origin with the duodenum. The growth of the former is more rapid than that of the latter. As the anlagen grow, they rotate around the inner aspect of the duodenum and meet posteriorly where coalescence takes place and development continues in one mass in the dorsal mesentery. The body and the tail grow upward and to the left so that they lie in the dorsal mesogastrium posterior to the stomach. As the stomach and dorsal mesogastrium change position the pancreas moves within the latter until its position is transverse, when it becomes fixed to the parietal peritoneum of the posterior abdominal wall.

The primitive outpouchings are lined with columnar epithelium which develops branching ducts. The main duct of the dorsal pancreas empties into the duodenum while that of the ventral pancreas anastomoses with it. Thus the duct of Wirsung arises from the main duct of the ventral pancreas and the distal half of the duct of the dorsal pancreas, while the duct of Santorini comes from the proximal duct of the dorsal pancreas.

At the end of the branches of the main duct the tubules have an enlarged bud which develops into acini, and the islet cells then appear in the connective tissue along the same ducts. The connective tissue is derived from the mesodermal tissue of the dorsal mesentery.

From the surgical standpoint it is logical to assume that the abnormal position of aberrant pan-

creatic tissue predisposes to inflammation and malignancy. It is possible that carcinoma of the duodenum, which is observed occasionally, originates in accessory pancreatic tissue. Following inflammation this type of tissue has been found to be the cause of intussusception and also of diverticula of the duodenum. Extension of the inflammatory process has produced bands and loopholes which later caused obstruction and strangulation.

There is no accepted theory as to the cause of accessory pancreatic tissue. Zenker believes it due to an anomalous formation of an additional diverticulum of the duodenum, while Glinski attributes it to failure of one of the primitive anlagen to coalesce with those of the main pancreas. These theories cannot be accepted, however, as the aberrant masses are small and not confined to the duodenum, having been found in the stomach, duodenum, jejunum, ileum, spleen, omentum, etc. The author believes that they are due to branching buds which come in contact with, and are then engrafted to, the various viscera in the process of their development. The size to which accessory pancreatic tissue grows depends upon the normal capacity of the bud engrafted in the abnormal situation to develop and upon its new environment.

MERLE R. HOON, M.D.

Hauke, H.: Traumatic Rupture of the Spleen and Its Treatment by Splenectomy (Beitrag zum Kapitel der traumatischen Milzruptur und deren Behandlung durch Splenektomie). *Beitr. z. klin. Chir.*, 1921, cxxii, 389.

From the many articles on traumatic rupture of the spleen it might be supposed that all questions pertaining to it had been fully settled. Recent work, however, has shown that there is no unanimity of opinion as to the clinical picture of rupture of the spleen or the composition of the blood after splenectomy.

The spleen which has undergone pathologic changes is very easily ruptured because of its increased size or because of its changed consistency. In the literature are reported the cases of apparently normal persons who suffered traumatic rupture of the spleen and on its removal the spleen was found to be increased in size and changed in structure.

The author reports an unusual case which he observed. In a fall from a height of 5 meters the patient ruptured his spleen and injured his left kidney. The injury of the kidney showed that the trauma was sufficient to rupture a normal spleen. The spleen showed several fissures passing through the entire parenchyma and converging toward the hilus. This is a frequent type of injury which is due to hyperflexion. The spleen showed also an increase in weight and the fibroid enlargement which is characteristic of Banti's disease. The splenic disease was first discovered at operation rendered necessary by the accident.

As a rule injury of the spleen can be merely suspected as tears of the liver, the pancreas, and the

mesentery often present the same symptoms. The most definite diagnosis possible is that of injury of internal organs. Such a diagnosis, however, is sufficient to justify operation. Finsterer says that injury of the liver is followed by bradycardia, and injury of the spleen by increased frequency of the pulse. In Hauke's cases, however, the quality and frequency of the pulse were not materially changed.

The general signs of internal abdominal injury, pallor of the skin and rapid pulse, are not as a rule well marked at the time when operation must be performed if the best results are to be obtained. Michelson states that in 12 per cent of the cases of rupture of the spleen there are also slight injuries of the left kidney which are manifested by hæmaturia and heal without surgical interference. In many cases, therefore, a slight hæmaturia may help to confirm the diagnosis of splenic injury.

It is better to operate once too often than once too late. Oser of Eiselberg's clinic recommends puncture of the abdomen for diagnostic purposes, but this is dangerous and too inaccurate as a routine procedure. Exploratory laparotomy gives much more accurate information and is not injurious in cases in which there is a doubt as to the diagnosis.

The best incision is the median incision for in cases of internal hæmorrhage any organ may be involved. If necessary, a transverse incision may be added. If there are tears extending deep into the parenchyma the spleen should be removed, care being taken not to injure the pancreas as the pancreaticosplenic ligament is often very short. No harm has ever resulted from removal of the spleen. In superficial tears of the capsule the spleen should be tamponed as suture is always uncertain on account of the friability of the tissue.

Following splenectomy other organs assume the functions of the spleen. Collections of lymphoid cells are found in the liver, and splenoid nodules in the abdominal cavity. As the spleen contains free iron, there is increased iron excretion after splenectomy. The changes in the blood picture are the most marked feature, but these may disappear completely in the course of months or years. They are due to the loss of the spleen and the loss of blood due to the injury.

The loss of blood causes a fall in the hæmoglobin content, a decrease which may equal 60 per cent. The average time required for the hæmoglobin to return to normal is two months. Probably the increased iron excretion also has something to do with this. Another result of the loss of blood is a decrease in the red blood corpuscles, but the number soon rises to normal. In the first few days normoblasts are found. The author did not discover polynuclear erythrocytes. There is also a marked leucocytosis which disappears in time.

In all of his cases the author collected the blood from the abdominal cavity, mixed it with 0.5 per cent sodium citrate solution, and re-injected it intravenously. He believes that in this way he saved many lives.

GANGL (Z).

Lombard, P.: A Method of Splenectomy: Subcapsular Splenectomy (Note sur un procédé de splénectomie; la splénectomie sous-capsulaire). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 826.

While splenectomy is easy when the spleen is mobile and has a long mesentery, it may be very difficult when the spleen is fixed to the neighboring organs by old, solid adhesions. Section of such adhesions occasionally results in fatal hæmorrhage and in some cases calls for long manipulations which produce shock.

In difficult cases Lombard decorticates the spleen. The plane of cleavage lies beneath the adhesions and between the thickened capsule and the splenic tissue proper. By incising this capsule and inserting the fingers beneath it the spleen may be rapidly decorticated and freed. Previous ligation or compression of the pedicle between clamps allows easy completion of the operation.

A case is reported in which Lombard removed a hypertrophied spleen by the method described. The organ was sclerotic and adherent close to the diaphragm and the posterior abdominal wall. The adhesions created a union which no effort could break. The spleen was easily decorticated after clamping and sectioning of the pedicle, and there was no hæmorrhage. Lombard has not been able to find this subcapsular or subserous decortication of the spleen described previously.

W. A. BRENNAN.

MISCELLANEOUS

Smital, W.: Stab Wounds and Gunshot Wounds of the Abdomen (Ueber Stich- und Schussverletzungen des Bauches). *Wien. med. Wchnschr.*, 1920, lxx, 653, 1257, 1305, 1442, 1501, 1547, 1601.

The author reports 56 cases of stab wounds and gunshot wounds of the abdomen which were observed in the Hochenegg Clinic in Vienna in the past ten years. They were all peace-time injuries and almost without exception were inflicted at close quarters. A large proportion of the gunshot wounds showed a wound of entry only and most of them were revolver wounds. Severe lacerations of internal organs such as are observed in war wounds were not found. The stab wounds were due to smaller instruments than those causing war wounds. The treatment of peace-time wounds, therefore, is a much more limited field than that of war wounds. The data of the cases reviewed are tabulated below:

The diagnosis of penetrating wounds is of great importance. It may be made easily if the abdominal contents protrude from the wound or the contents of the intestines or bladder issue from the wound. In other cases it is difficult, if not impossible. A clue may be given by the direction of the wounds of entrance and exit in cases of through-and-through wounds, and by a hæmatoma in cases in which the bullet is retained. According to Hagen, shock may be entirely absent in intra-abdominal wounds. An anæmia following closely upon the injury, however, is of diagnostic value.

According to Laewen, the presence of abdominal rigidity is not of itself a very certain diagnostic sign of a penetrating wound of the abdomen. Generalized tenderness on pressure a few hours after the injury indicates peritoneal irritation but is not a symptom which should be awaited. Of significance as to the nature of the abdominal wound is the percussion note. Dullness shifting with change of posture (Albrecht), absence of liver dullness in large wounds of the intestine (Albrecht and Laewen), circumscribed tympanitic zones (Hassler), and hissing intestinal sounds are symptoms of penetrating wounds.

Hochenegg, Albrecht, and Riedel placed emphasis on the importance of the pulse. A small frequent pulse is often noted. Nausea, vomiting, and hiccup are symptoms of peritoneal irritation, but not necessarily of penetration. Of greater significance is Lenk's X-ray procedure to determine the collection of gas in the abdominal cavity. In general it may be concluded that a positive diagnosis of a penetrating wound is not always possible in the period immediately following the injury. The author discusses also retroperitoneal and intraperitoneal injuries.

Immediate and careful transport of the patient should follow the application of a compression bandage. According to Hochenegg, every wound of the abdominal wall should be widened as early as possible in order that it may be determined whether the peritoneum is involved. If this proves to be the case, a laparotomy is indicated.

The definitely positive indications for operative treatment are: (1) extrusion of abdominal contents (omentum, gut, stomach, the parenchymatous organs); (2) escape of gastro-intestinal contents or urine from the external wounds; (3) severe anæmia associated with an increasing zone of percussion dullness indicating a severe hæmorrhage; (4) the

STAB WOUNDS AND GUNSHOT WOUNDS OF THE ABDOMEN

	No. of cases	Gunshot wounds	Stab wounds	Operated upon	Not operated upon	Re-coveries	Deaths
Perforating wounds with injuries to internal organs..	35	19	16	32	3	27	8
Perforating wounds without injury to internal organs	10	2	8	7	3	10	..
Perforating wounds, total	45	21	24	39	6	37	8
Non-perforating wounds.....	11	3	8	2	9	11	..
All cases, total	56	24	32	41	15	48	8

X-ray demonstration of the escape of gas into the peritoneal cavity.

The relatively positive operative indications are: (1) peritoneal irritation phenomena (nausea, vomiting, abdominal rigidity, tenderness on pressure, défense musculaire, small rapid pulse, dullness in the flanks, absence of liver dullness, voluntary kyphosis, increased peristalsis, costal breathing); (2) the direction of the path of the projectile through the body as suggested by the relative positions of the wounds of inlet and outlet or of the wound of inlet and the point, if determinable, where the projectile is lodged.

Negative indications as regards operation are: (1) open, non-penetrating wounds; (2) a general condition indicating inevitable death.

In conclusion the author advocates active treatment and describes the technique of operation. Ether is the anæsthetic of choice. The diagnosis of wounds of the individual internal organs is discussed. The greatest danger in gunshot wounds of the abdomen is hæmorrhage. Wounds of the gastrointestinal tract have the poorest prognosis, the mortality being 28.5 per cent. When there is associated involvement of the diaphragm the prognosis is still more unfavorable. GLASS (Z).

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Bancroft, F. W.: *Acute Hæmatogenous Osteomyelitis.* *Ann. Surg.*, 1921, lxxiii, 681.

In acute hæmatogenous osteomyelitis in children primary operation with removal of only sufficient cortex to allow adequate drainage and thorough postoperative treatment with Dakin's solution will frequently preserve the remaining cortex which often is seemingly dead. Moreover, deformity may be prevented and the period of disability shortened. The recent war attracted attention to the problems of chronic and traumatic osteomyelitis but little has been written of the acute hæmatogenous variety occurring in children.

Bone infection among children differs from that in adults as in the former the epiphysis is not yet united to the diaphysis and therefore the problems of therapy necessarily differ. The infection is believed by many to start in the metaphysis near the epiphysis. It may then spread throughout the medullary cavity or haversian canals to beneath the periosteum, or extend to the neighboring joint, being diverted by the epiphysis through the cortex, where it travels under the capsule, or by penetrating the epiphysis.

Lexer shows very clearly that with the exception of the circumferential lamellæ, the diaphysis is supplied almost entirely through the nutrient artery, while the epiphysis and neighboring portion of the metaphysis receive an abundant blood supply from the numerous metaphyseal arteries. It is in the relatively avascular zone between the diaphysis and metaphysis that infection probably begins.

In 1919 the author attempted to produce osteomyelitis in dogs by introducing into drill holes in the cortex of the humerus croton oil contained in capillary tubes the ends of which were sealed with agar-agar. By this procedure the operative repair was allowed to progress before the croton oil was liberated from the capillary tubes. A chemical osteomyelitis was produced with the resultant formation of a sequestrum often 5 to 10 cm. in length. Subsequently the sequestrum gradually dis-

appeared so that at the end of two months it was impossible to detect its former outlines with the X-ray. The process is similar to that found in any bone transplant; gradual absorption and deposition of new bone occur throughout the haversian canals until all the dead bone has been replaced. The author believes that a process similar to this may take place in similar conditions in the human being.

Bancroft discusses eleven cases of acute osteomyelitis in children on Pool's service at the New York Hospital. Trauma was the most prominent etiological factor in the series. Six of the patients had received injuries from ten hours to two weeks before the onset of the acute process. Bancroft believes that trauma and the presence of bacteria in the blood stream were the cause of the osteomyelitis, a fact which has been demonstrated in animal experimentation by Lexer and others. In three cases, however, no history of previous injury or infection was given. In one case a recent tonsillitis might be assumed to have been the etiological factor.

The tibia was involved in five cases, and in four of these the upper portion was affected. In four cases the condition was present in the femur in the region of the lower epiphysis, and in one, at the epiphysis of the ulna. Neighboring joints were definitely infected in four cases and metastatic joint involvement occurred in one. Three cases developed metastatic osteomyelitis in the long bones in addition to the primary focus. All the patients showed signs of severe infection. No amputations were done. There was one death, that of a boy of 17 who had osteomyelitis of the femur and died from sepsis and cardiac failure twenty-four hours after admission to the hospital.

Following their dismissal from the hospital two of these patients were lost track of after two years. One of them had a small sinus when last heard from and the other was well. The other patients were followed from one to five years and are now well. Two who had joint involvement now have ankylosis, one of the knee and the other in the hip.

The treatment of acute osteomyelitis in children may properly be divided into that of the acute

stage and that of the subacute stage. At the onset the relief of pus under pressure is the primary indication for operation. Simmons of the Massachusetts General Hospital has suggested the drilling of numerous burr holes through the cortex into the medullary canal to effect preliminary drainage. The author believes that this is sufficient in certain cases but states that it is difficult to determine the extent of the process by this method and that when postoperative Carrel-Dakin treatment is given it is probably more conservative to remove more of the cortex in order to obtain adequate exposure and drainage.

Joint infections showing the presence of the staphylococcus aureus are usually amenable to aspiration and irrigation. Bancroft believes that in one of the cases of the series reviewed in which the knee joint was drained it would have been better to aspirate.

In the subacute stage it was formerly considered the best technique to remove the sequestrum when the involucrum was strong enough to maintain the shape of the limb, but in the author's opinion the introduction of the Carrel-Dakin technique will give results very similar to those obtained in animal experimental work. In certain cases of his series a marked regeneration of bone was obtained where either the X-ray or the gross examination had shown definite necrosis. He reports in detail the progress of several cases demonstrating this fact and summarizes his conclusions as follows:

Adequate drainage should be obtained with as little trauma as possible.

When the patient is progressing favorably, bone which appears dead on X-ray or gross examination may frequently be saved to advantage to prevent deformity and hasten convalescence.

The article has numerous illustrations.

L. D. PRINCE, M.D.

Tavernier, L.: The Epicondylitis of Sportsmen (L'epicondylite des sportsmen). *Lyon chirurg.*, 1921, xviii, 257.

Epicondylitis is ignored by the great majority of practitioners although it is a common affection and has been the subject of numerous articles during the past twenty-five years. It is characterized by very sharp pain in the vicinity of the epicondyle in the course of violent or prolonged exercise. There are no local objective signs. The lesion persists for several months and recurs on resumption of the exercise which caused it. It is observed especially in tennis players and fencers although violinists, fishermen, and many others who work with stretched arms also suffer from it. The pain is not spontaneous but is produced by movements or direct pressure. The whole upper part of the arm is painful on pressure but more particularly the epicondyle and the external part of the articulation. The most tender spot is on the anterior surface of the epicondyle, a little below and about 1 cm. inside the apex of the apophysis. While other movements are

less painful, the least effort of direct extension is insupportable.

Characteristic of the disease are its progressive evolution and extreme tenacity. When after some weeks of rest an almost complete cure is believed to have been effected the least resumption of exercise with the arm will immediately provoke pain.

Various authors have suggested different anatomical origins of this lesion. Many think it an osteitis or an osteoperiostitis. The author, who has himself suffered from epicondylitis, describes the pain as being localized to the anterior surface of the epicondyle where the common tendon of the radial muscles and the extensors of the fingers is inserted, exactly at the union of the bone and the tendon fibers. He is of the opinion that small particles are broken off here and that a condition of persistent irritation is brought about which in time is manifested by an osteogenetic reaction of the periosteum. He is aware, however, that such a theory does not fully account for the persistence of the condition.

None of the usual methods will assuage the pain. In one case surgery was tried with a good result. The epicondyle, which appeared abnormally vascularized, was resected. The author believes that an incision beneath the epicondyle followed by a stroke of the rugine over the anterior surface of the apophysis and slight curettage, if necessary, would be beneficial in very rebellious cases. Ordinary cases must be treated by rest. W. A. BRENNAN.

Ciconardi, G.: Tuberculosis of the Foot (La tubercolosi del piede). *Chir. d. organi di movimento*, 1921, v, 209.

One hundred and forty-five cases of tuberculosis of the foot have been observed in the Rizzoli Orthopedic Institute, Bologna, in the course of the past twenty years. Seventy-eight of the patients were males and 67 females. The majority were between 5 and 20 years of age. The right foot was involved in 78 cases; the left, in 67. A positive family history of tuberculosis was given in 36 cases and a positive personal history in 28. Thirty-eight patients had had an injury.

In 64.8 per cent of the cases the lesion involved the tibiotarsal articulation. The tarsal joint alone was involved in 19.3 per cent.

The anatomic-pathologic type was synovial in 94, osseous in 16, and mixed in 35. The lesion was non-suppurative in 94, suppurative in 29, and fistulous in 22. Eight of the fistulae developed after aspiration with a trocar.

One hundred and twelve of the patients were treated conservatively by immobilization, heliotherapy, etc. Of these, 11.6 per cent were cured, 40.1 per cent were benefited, 25.9 per cent were not benefited, 19.6 per cent are still under treatment, 0.8 per cent are worse, and 0.8 per cent are dead.

Thirty-two cases were operated upon. Twenty-eight of the operations were conservative and 4 were amputations. Of these patients, 42.4 per cent were cured, 16.1 per cent were benefited, 12.1

per cent became worse, and 1 died. All those treated by amputation recovered.

Of the total number of patients, 56.4 per cent were cured or benefited, 16.5 per cent are still being treated, and 20 per cent were dismissed without result.

W. A. BRENNAN.

FRACTURES AND DISLOCATIONS

Putti, V.: Encircling with Metallic Ribbon in the Operative Treatment of Fractures (Le cerclage au ruban dans le traitement sanglant des fractures). *Lyon chirurg.*, 1921, xviii, 133.

Putti first published his method of uniting fractures by metallic strips in December, 1914. Parham's similar method was reported in the United States in March, 1914. Flat metal strips or ribbons were adopted because of the inconveniences due to the use of metallic wire twisted at the ends. The wire did not adhere sufficiently to the irregularities in the surface of the bone and could not be applied sufficiently tight because of the risk of breaking the twisted ends. The metallic strip adheres to the surface of the bone and resists traction upon it much better than the wire. The use of a special knotting "fixator" avoids the inconveniences arising from torsion of the ends of the metallic wire. The force can be graduated, the knotting is automatic, and the whole operation of encircling can be done without touching the field of operation with the hands.

The ribbon used by Putti is a strip of bronze alloy 2 mm. wide and 250 mm. long. In one end is a slit through which the other end is passed to form the knot. The fixator is a screw arrangement which receives the free end of the ribbon, draws it through the slit as far as may be desired, and then knots it. The ribbon may be passed around the fractured bone over or beneath the periosteum. When the desired tension in the metallic strip is obtained the fixator is turned to form the knot and the end of the ribbon is cut.

Generally two bands are placed on a fracture. In transverse fractures these ribbons may be used advantageously instead of screws to hold metallic plates in position. In such cases Putti uses steel plates covered with rubber in which are grooves to receive the ribbons and prevent their slipping. In open or infected war fractures encircling has been employed as a temporary method of fixing the fragments. The method may be used also to fix a bone graft; it obtains solidity of union difficult to secure by any other means.

W. A. BRENNAN.

Froelich, M.: The Correction of Antetorsion of the Upper End of the Femur in Congenital Dislocation of the Hip (L'antétorsion de l'extrémité supérieure du fémur dans la luxation congénitale de la hanche; sa correction). *Rev. d'orthop.*, 1921, xxviii, 213.

When a human femur is laid on a table on its posterior surface the two condyles rest on the table. The head and the neck, however, do not touch it

but look forward and inward. The axis of the two condyles and that of the head and neck do not lie in the same plane. This is due to the fact that the upper end of the femur is twisted in such a way as to lift the head and neck. The antetorsion is generally about 15 degrees; in congenital dislocation of the hip it is often exaggerated to 60 or even 90 degrees. To reduce the dislocation it is necessary to rotate the limb forcibly inward so that the knee looks inward, but when the limb is again placed in a normal position the head of the femur again comes out of the acetabulum.

If the antetorsion is not very pronounced it can sometimes be corrected in the course of treatment but in other cases it has been found necessary to do an osteotomy on the middle or upper part of the femur, rotating the lower fragment outward and leaving the upper fragment in position. The author states that this operation can be avoided by a very simple procedure. When reduction has been accomplished and the knee has been rotated inward for some months the plaster cast should be cut away at a point three finger-breadths above the knee. Then the femur should be broken against the lower edge of the cast. This is not difficult as the bones of children who have been immobilized in a cast for several months are very fragile. After the fracturing the knee should be rotated outward into its normal position and a new cast applied for another month. At the end of this time the supracondylar fracture will be completely healed.

Extreme antetorsions necessitating osteotomy are rare. In 1,000 cases the author had only 10 (1 per cent).

A. G. MORGAN, M.D.

Dujarier, C.: The Operative Technique of Screwing the Neck of the Femur in Recent Fractures (Technique opératoire du vissage du col fémoral dans les fractures récentes). *Presse méd.*, Par., 1921, xxi, 421.

A description is given with numerous illustrations of a specially constructed table provided with a screw holder to be used in screwing together the two fragments in fracture of the neck of the femur, the screw being run from the lower fragment across the line of fracture deep into the head of the femur.

The author generally places the table in the X-ray room so that roentgenograms may be taken at various stages of the operation to show whether the screw is in proper position. The screws are from 7 to 10 cm. long (generally 8 or 9 cm.), and have coarse threads throughout their entire length and a sharp point so that it is not necessary to bore the bone first.

An incision is made 2 cm. below the great trochanter and the bone exposed after the fracture has been reduced by traction. The location of the head of the femur is marked on the skin and the screw passed into the middle of the external surface of the femur and directed toward this point. Delbet states that the screw will penetrate the head of the femur if it is inserted at a point midway between the

anterior and posterior borders of the femur and inclined at an angle of 12 degrees from the horizontal. The author has found this rule sufficiently accurate. For greater certainty, however, he takes a roentgen picture before screwing the bone, and another afterward to be sure that the position is correct.

Dujarier has used the method in eighteen cases with excellent results. The pain is relieved at once. He believes that the patient should not walk for a month after the operation but states that active and passive movements may be practiced in bed from the day afterward. The results of the procedure described are much better than those following the classical treatment for fracture of the femoral neck.

A. G. MORGAN, M.D.

Whitman, R.: The Reconstruction Operation for Ununited Fracture of the Neck of the Femur. *Surg., Gynec. & Obst.*, 1921, xxxii, 479.

Lack of union in fractures is due, first, to malposition of the fragments, and second, to poor nutritional conditions.

Operation may often be avoided by placing the limb in full abduction at the time of injury. This accomplishes the same purpose as bone-pegging, and does it at the most effective time.

Pain is a much more frequent symptom of non-union than is commonly believed. This may be due partially to a sympathetic arthritis and to grating of the fragments.

When there is coxa vara, adduction takes place because of the loss of leverage of the abductor muscles, the trochanter being displaced upward. This is one of the main objections to the ordinary operations in which the head of the femur is removed and the neck or trochanter is placed in the acetabulum. Following such operations the attainment of good alignment and freedom of motion becomes a serious difficulty. The procedure presented by the author is as follows:

An incision in the shape of a half U is made from 1 in. posterior to the anterior superior spine, downward and backward, so that it crosses the femur horizontally at 3 in. below the apex of the trochanter. The interval between the gluteus medius and the tensor vaginæ femoris is exposed, the capsule opened, and the head of the femur removed.

The anterior margin of the gluteus minimus is exposed and the base of the trochanter chiselled loose at this point. The upper extremity of the femur is then smoothed and placed into the acetabulum in 25 degrees of abduction.

The trochanter with the muscles attached is brought downward as far as it will go and attached to the outer surface of the shaft of the femur from which the cortex has been partly removed by means of a bone peg or with sutures through the bone. Closure is effected in layers. A long plaster spica is worn for about four weeks, when it is replaced with a short one and weight-bearing is encouraged to promote joint action.

The author suggests that this operation might be used as a substitute for arthroplasty in cases of ankylosis.

R. V. FUNSTEN, M.D.

Murphy, E. C., and Dorrance, G. M.: The Results of Treatment of Twenty Recent Cases of Intracapsular Fracture of the Femur by Abduction and Plaster Fixation. *Ann. Surg.*, 1921, lxxiii, 752.

In this series of 20 recent cases of intracapsular fracture of the femur treated by abduction and plaster fixation, the ages of the patients varied from 37 to 80 years. Only 2 were males.

Six patients had decubitus on admission and were cured after the application of the cast.

The X-ray report of these cases after removal of the cast showed that the youngest patients had osseous union. Sixteen had fibrous union and in 4 cases this union was dense. The 2 other patients died of pneumonia during the treatment.

Nine patients had full restoration of function. Eight have slight impairment of function, but all are able to walk. In 1 case there was complete absorption of the neck of the femur with shortening of $2\frac{3}{4}$ in. which makes it necessary for the patient to wear a shoe with an elevated sole. In the remaining cases the shortening varied from $\frac{1}{4}$ to 1 in.

R. S. REICH, M.D.

Speed, K.: Analysis of the Results of Treatment of Fractures of the Femoral Diaphysis in Children under 12 Years of Age. *Surg., Gynec. & Obst.*, 1921, xxxii, 527.

Sixty-seven cases form the basis of this paper. Fourteen of the patients were under 2 years of age, twenty-three were between 2 and 6, and thirty were between 6 and 11 years. The salient points brought out are:

1. Operations for fresh fractures of the femoral shaft in children are to be avoided.

2. Immediate treatment should be given; every hour of delay diminishes the ease and possibility of perfect reduction.

3. Plaster casts are inadequate to maintain extension and alignment of the fragments.

4. The most efficient method of holding the reduction after it has been obtained is continuous suspension traction by means of a suspension splint and overhead frame.

5. Walking should not be allowed until a walking caliper splint is fitted to the patient. This allows his weight to be borne on the ischium and should be worn for three to six months after he gets up or until the callus has become sufficiently hardened for weight-bearing.

In most of the cases the reduction was effected under anæsthesia on a fracture table by mechanical traction. If a complete reduction cannot be obtained the surgeon must be satisfied with the best reduction possible; provided it will result in good function, or he must perform an open operation. Lane plates are suitable only for transverse frac-

tures. In late cases all callus must be removed and at six weeks the plate should be removed.

Autogenous intramedullary bone pegs are excellent for patients over 7 years old. The thin soft cortex of the bones of children precludes the use of bone or ivory screw fixation. Cases in which there is a very low fracture of the shaft or in which the skin becomes too sore for traction should have caliper extension. For this, the nail method is preferred to all others. W. A. CLARK, M.D.

Hallopeau, M. P.: The Use of Encircling Bands in the Treatment of Fractures of the Femur (Du cerclage dans les fractures du fémur). *J. de chir.*, 1921, xvii, 551.

The author describes his technique with numerous illustrations. The incision is always made on the side of the thigh so that it exposes the external surface of the femur. Here the bone is closest to the surface and no large vessels or nerves will be met. Only the vastus externus and the crural muscles lie between the surface and the bone. The fibers of these are separated; it is not necessary to cut them. The patient is strapped to the table and the table then tilted laterally at an angle of about 30 degrees.

Hallopeau prefers Parham's bands. He shows illustrations of a specially constructed lateral splint which he employs in the rare cases in which the extent of the fracture makes an additional brace necessary. He prefers to operate under general anæsthesia but has no objection to spinal anæsthesia if there is any special reason for it. The X-ray plate is always kept in view so that the incision will be made in the right area.

The two fragments are caught with Lambotte clamps, necessary traction while the fracture is reduced being made by the assistant. The plates are then passed under the femur and fastened around it by means of an instrument devised by Collin. Care is taken not to disturb the periosteum any more than has been done by the accident. Hallopeau believes that the large hyperostoses often observed after treatment of fracture by the screwing on of lateral plates are due to the destruction of periosteum necessitated by this method. After the plates have been applied he always tries to suture the flaps of periosteum together over them.

Hallopeau has used this method in eighteen cases of fracture of the femur with uniformly good results. There has never been the slightest sign of infection, and consolidation was complete by the end of six weeks except in one recent case in which there is still some mobility at the end of two months.

Following the operation a plaster cast enclosing the pelvis and the leg down to the ankle and with a window at the site of the fracture is applied. This is left on for a month or may be removed at the end of ten days when the sutures are taken out, an ambulatory cast which enables the patient to walk being then applied.

The method described is simpler than that in which lateral plates with screws are used, and consolidation takes place much sooner.

A. G. MORGAN, M.D.

Lillenthal, H.: Compound Fracture of the Femur Treated by Intramedullary Splint—End-Result. *Am. Med.*, 1921, n.s. xvi, 240.

The author reports an interesting case of fracture of the femur in which a perfect result was obtained by the use of an Elsberg intramedullary aluminum splint.

The patient was injured in 1910 and was operated upon two weeks later. The fragments having been exposed, the upper fragment was delivered into the wound and about an inch was removed with a Gigli saw. The marrow in each fragment was then curetted for about an inch and an intramedullary Elsberg splint snugly fitted into the two ends. The patient made an uneventful recovery and when he was examined in 1919, nine years after the injury, the X-ray showed the condition of the fragments to be practically perfect.

The Elsberg splint consists of a sheet of metal about 1 mm. in thickness which has a number of circular perforations for drainage and is rolled into the form of a cylinder with the edges not quite in apposition.

The author does not particularly recommend the method described and states that he has used it only in certain extraordinary cases. This case is reported as a surgical curiosity and because of the excellent result. L. D. PRINCE, M.D.

Rochedieu, W.: A Case of Downward Horizontal Dislocation of the Patella. (À propos d'un cas de luxation horizontale inférieure de la rotule). *Rev. méd. de la Suisse Rom.*, 1921, xli, 305.

The most common variety of dislocation of the patella is the lateral external dislocation. More unusual varieties are lateral internal dislocation, vertical dislocation, inversion, and horizontal dislocation, which may be upward, the patella turning around its transverse axis so that its lower pole enters the tibio-femoral joint while its upper pole points forward, or downward, the upper pole being in the joint and the lower pole pointing forward.

The case reported by the author was of the latter variety. This requires violent pressure on the upper edge of the patella to push it down to the tibio-femoral joint and the tibio-femoral joint must be in a certain degree of flexion to admit the edge of the patella. The author's case was that of a boy 18 years of age who was thrown from a motorcycle while he was going at full speed. He was thrown forward on the road 10 meters and could not rise.

On examination an erosion of the knee and anterior surface of the left thigh was found. The normal site of the patella was empty. Just below, at the level of the tibio-femoral joint, was a protuberance which proved to be the lower pole of the patella lying perpendicularly and fixed in the joint. The

leg was flexed at about 140 degrees. Active movement was impossible and passive movement very painful. There was also a compound fracture of the tibia between the middle and lower thirds.

An attempt at non-operative reduction of the patella failed. The patient was given antitetanus serum and the open wounds were treated with Dakin's solution for five days. Operation was then performed. The joint capsule was found to be torn and a large hæmatoma had formed in the joint. There was complete disinsertion of the upper edge of the patella which was directed backward and inward while the lower pole looked outward and forward. As the leg was flexed there was no difficulty in withdrawing the patella from the joint. It was then re-inserted in the quadriceps tendon and held in place with two silver wire sutures. The joint capsule was sutured and the fracture of the tibia reduced. The wound was drained for two days. At the end of a month the fracture of the tibia was consolidated and the patella in normal position.

A. G. MORGAN, M.D.

Ogilvie, W. H., and Massie, G.: Two Cases of Dupuytren's Fracture Treated by Screws. *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Clin. Sect., 63.

Abduction fractures fall into three classes: (1) those which do not require operation; (2) those which must be operated upon; and (3) those which the surgeon would like to operate upon but cannot.

The first class includes all fractures described as Pott's fracture. As long as there is no separation at the inferior tibio-fibular joint the method recommended by Jones, i.e., reduction under an anæsthetic, followed by fixation in plaster in a position of full inversion and full dorsiflexion, will give an excellent anatomical and functional result. Occasionally a "Z" tenotomy of the tendo achillis is necessary in addition.

When there is separation of the inferior tibio-fibular joint, non-operative means have always failed to give a satisfactory result because it is impossible to obtain effective lateral pressure which will reduce the dislocation, and the outer edge of the astragalus is constantly being pulled between the two bones. In such cases a single $1\frac{1}{2}$ in. screw driven in an inward and upward direction through the external malleolus into the tibia after reduction of the deformity will effectively fix the fragments. The two cases reported show satisfactory anatomical and functional results.

The cases forming the third class show much comminution of the external malleolus and of the articular surface of the tibia in addition to separation of the inferior tibio-fibular joint. In a recent case a satisfactory result was obtained by giving an anæsthetic in the fourth week when there was a fair amount of sticky callus, tenotomizing the tendo achillis, and reducing first the backward dislocation and then the eversion and separation of the malleoli with a Thomas wrench.

R. S. REICH, M.D.

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Auvray: Dead Tendon Grafts: Personal Observations (Greffes tendineuses mortes: observations personnelles). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 749..

Auvray studied the functional end-results in cases in which grafts of dead tendon were used. His study is based on the observation of four cases he has operated upon since 1919 and upon thirteen other cases which have been reported in recent literature. All of the operations were done on the extensor and flexor tendons of the fingers. In none of these cases—some of which have been followed for a long time—was the graft eliminated, not even in those in which there was slight infection.

As regards the functional results a distinction must be made between the extensor and flexor tendons. In seven cases in which extensor-tendon grafts were implanted no poor result was reported; in the majority there was total recovery of movement. In the flexor tendons the functional recovery on the whole was not so good. When the grafts were implanted in tendons destroyed by suppuration the results were not always satisfactory, but the large number of good functional results justify an attempt to graft tendons on tendons of the palm of the hand which have been destroyed by suppuration.

The results are best in simple traumatic cases. Tendon grafting is especially apt to fail when it is done in the vicinity of the digital sheaths. While in many cases complete restoration was not obtained, very appreciable benefit was derived from the operation.

W. A. BRENNAN.

Nutt, J. J.: Rupture of the Tendon of Insertion of the Biceps Flexor Cubiti. *J. Am. M. Ass.*, 1921, lxxvi, 1825.

The case reported was that of a man who stated that he had felt something give in the upper arm as he was swinging from ring to ring in a gymnasium. As he felt no pain or weakness he continued exercising. During the night there were slight twinges in the arm and he noticed a difference in the shape of his right arm as compared with the left.

Examination showed that the bulging of the biceps when the elbow was flexed was $1\frac{1}{2}$ in. higher in the right arm than in the left, the circumference of the right arm was $12\frac{3}{4}$ in. while that of the left was $12\frac{1}{8}$ in., and the power of flexion in the right arm was less than that in the left.

At operation the distal tendon of the biceps was found ruptured close to the bicipital tuberosity. The proximal end lay coiled in the upper half of the arm. The distal end was $1\frac{1}{2}$ in. long. The small piece of tendon was wrapped with the proximal end and sutured with chromicized catgut, the arm being then put in flexion with plaster of Paris.

When the plaster was removed six weeks later voluntary contraction of the biceps showed its

attachment to the radius. A right-angle splint was then applied.

Three months after the operation the tendon had apparently gained its normal dimensions and strength.

The literature gives the reports of 65 cases of rupture of the biceps, 17 cases of rupture of the tendon, 44 cases of rupture of the muscle, and 6 cases of rupture of the juncture of the tendon and muscle. Only 6 cases were operated upon. Two of the latter were cases of rupture of the tendon of insertion.

R. S. REICH, M.D.

Tavernier: Total Resection of the Sternum for Tuberculosis (*Résection totale du sternum pour tuberculose*). *Lyon chirurg.*, 1921, xviii, 223.

Tavernier's case was that of a soldier 26 years of age who had been operated upon two years previously for bilateral cervical adenitis but returned to the hospital with multiple fistulae in the sternum. On exploration in April, 1920, a large retrosternal abscess was found behind the fistular openings. The lower three-fourths of the sternum and the inserted costal cartilages were resected, the abscess was curetted, and the fistulous tracts were excised.

In July, 1920, examination showed sternoclavicular arthritis on the left side which necessitated resection of the end of the clavicle, the first two costal cartilages, and almost all the rest of the sternum. Only a very small fragment, which was scarcely 2 cm. thick and articulated with the right clavicle, remained. Heliotherapy was then given, but a small fistula persisted. In October, 1920, the first rib was extirpated to its vertebral insertion because of osteitis. Although following the operation the patient had an attack of influenzal pneumonia he recovered. Today he has only a slight fistula and this is closing.

The author calls attention to the fact that he did not risk the removal of the entire sternum in one stage. The second operation was delayed until the resected lower costal cartilages were re-united by a solid fibrous band. The serious respiratory disturbances observed following the first operation indicated that the total removal of the sternum in one operation would not have been tolerated. In spite of the collapse of the thorax the patient was able to withstand without cardiac weakness a very serious pneumonia with severe dyspnoea. Movements of the arms have been well preserved and the patient does not complain of any functional trouble. The deformity, however, is very great.

W. A. BRENNAN.

Smith, S. A.: Fractures Occurring in Bone Grafts. *J. Orthop. Surg.*, 1921, iii, 270.

In the main, the author supports the views of Gallie and Robertson regarding the death, absorption, and replacement of the autogenous graft by osteoblasts.

The first and most common type of fracture, the disintegration fracture, occurs about the sixth week

when absorption outstrips restitution. It is favored by the use of soft cancellous bone such as a rib graft. Union may occur if the bone is strictly immobilized.

When a fracture is complete little further absorption takes place if the graft has a good matrix. The unilaterally fixed graft becomes hard, sclerotic, and peg-shaped. There is typical non-union. At operation two years later it will be found avascular and hard and without signs of canalization, even when full function is allowed.

If the graft survives three or four months without disintegration, the operation may be considered successful. However, it is at this stage that the second type, or clay pipe-stem fracture is apt to occur, usually at the center of the graft.

The author advises large coaptation surfaces and rigid immobilization in the early weeks after operation. He believes that because of this procedure the disintegration of grafts has become less common than formerly. ROBERT V. FUNSTEN, M.D.

Bryan, C. W. G.: A Case of Osteitis Fibrosa Treated by Resection of Four Inches of Humerus and Insertion of a Boiled Beef-Bone Graft. *Lancet*, 1921, cc, 1129.

A girl, aged 10 years and 9 months, sustained a pathologic fracture through a zone of osteitis fibrosa in the upper part of the right humerus. At open operation twelve days later the bone was found to be extensively destroyed and replaced by fibrous tissue. The thin shell of cortical bone which remained had been fractured. A section of the humerus 4 in. long was resected and replaced by a boiled beef-bone graft 5 in. long, $\frac{7}{8}$ in. wide, and $\frac{1}{2}$ in. thick. A number of holes had been drilled in the graft transversely and longitudinally. Following closure of the wound without drainage a plaster cast was applied.

At the end of the third week after the operation careful active movements were allowed and light massage was given twice a week for two weeks. Successive roentgenograms taken from one to three and one-half months after the operation showed the development of new bone of increasing density. The new bone surrounded the graft and apparently filled the drill holes. The function of the arm was fully restored in seven weeks.

The operation described is considered advantageous because it is not necessary to disturb another bone to obtain a graft, beef bone is stronger than an autogenous graft, and as prolonged immobilization is avoided, the muscles rapidly recover their size.

H. T. JONES, M.D.

Southam, A. H.: The Treatment of Acute Pyogenic Infection of the Knee Joint. *Brit. M. J.*, 1921, i, 884.

Acute pyogenic infection of the knee joint may be caused by trauma, extension of inflammation from a neighboring focus, or infection from the blood stream. The old treatment of inserting drainage tubes into the joint through vertical incisions on either side of

the patella was frequently disastrous because of extension of the infection up and down the leg along the fascial planes. The drainage tube acts as an entrance for secondary infection and as a foreign body which tends to prolong the inflammatory reaction. Furthermore, it is anatomically impossible to drain the knee joint efficiently.

The synovial membrane has considerable power to overcome septic infection, but as the virulence of organisms is increased when they are contained in a swollen and inflamed joint, it is necessary to lower the intra-articular tension and keep it reduced. In mild infections this may be accomplished by aspiration or by incision and lavage followed by suture of the joint. In acute pyogenic infection radical treatment is usually necessary.

During the war Willems suggested active movement of the joints after incision to provide free drainage. Patients object to this on account of the pain. Moreover, it is questionable if active mobilization is permissible for a joint infected by streptococci in an already toxic patient.

On the basis of his experience in the war the author recommends the following procedure which gave a useful limb and a movable joint in seven of his cases:

Immediate operation having been indicated by aspiration of fluid containing pus cells and pyogenic organisms, the knee joint is opened under general anaesthesia by lateral incisions extending from the head of the tibia to the upper limit of the sub-crural pouch and thoroughly irrigated with hot saline solution. The synovial cavity is then dried with lint swabs saturated in ether, and a small quantity of "bipp" is applied to the articular surfaces. The lateral incisions are left open for drainage and a dressing of gauze is applied. The limb is placed in a Thomas splint with the knee slightly flexed and held in extension with a light weight.

Following this operation the temperature usually falls about the third day and the patient's condition gradually improves. The dressings are not changed until the fourteenth day when more "bipp" is applied to the incisions. The splint is then removed and the patient encouraged to move the joint. Mobilization and massage must be instituted as soon as the active inflammation has subsided. The patient should be urged to walk as soon as possible.

MERLE R. HOON, M. D.

Solieri, S.: Operative Treatment of Osgood-Schlatter Disease (Sulla cura operatoria della malattia di Osgood-Schlatter). *Chir. d. organi di movimento*, 1921, v, 353.

Solieri refers to the operation performed in 1917 by Soule in a case of Osgood-Schlatter disease. Soule cut a hole about 2 cm. deep in the tibial tuberosity and in it inserted a piece of bone removed from the tibial cortex. The patient walked without trouble after seven weeks.

Solieri tried this operation recently in the case of a boy 12 years of age. After boring a hole about

6 or 7 mm. in diameter in the tibial spine, he detached a triangular piece from the tibia about 5 cm. long and 5 or 6 mm. thick, trimmed it to the shape of a nail, and drove it with a mallet into the tibial tuberosity. The wound closed by first intention and on the thirty-first day the patient was able to walk without the help of a cane.

A radiograph made four months after the operation showed the region of the tibial tuberosity to be well ossified. There was no distinct shadow of the bone graft. The recovery therefore seems permanent and complete.

In Solieri's opinion this case demonstrates that Soule's operation will cure the anatomical lesion and abolish the clinical symptoms of Osgood-Schlatter disease. He believes it a more logical procedure than that of Matsuoka who in two cases effected a subperiosteal ablation of the altered tibial tuberosity.

Trauma played no part in Solieri's case. The cause was probably local dystrophy or dysplasia. Solieri believes that some dysfunctioning of the endocrine glands may be responsible for the condition. In his own case he gave thyroid treatment postoperatively.

W. A. BRENNAN.

ORTHOPEDICS IN GENERAL

Cohn, L.: Observations on the Normally Developing Elbow. *Arch. Surg.*, 1921, ii, 455.

From a study of a series of roentgenograms of the elbows of children from infancy to 17 years of age the author draws the following conclusions:

The distal humeral epiphysis develops from four centers which are, in the order of their appearance, the capitellum, internal epicondyle, trochlea, and external epicondyle. The earliest recorded appearance of the capitellum was at the age of seventeen months. The internal epicondylar center may appear at the seventh year but is not constant at this age and may not be present as late as the tenth year. The various textbooks, however, give the time of its appearance as the fifth year. A beginning trochlea has been found at 8 years of age; textbooks say between the ages of 10 and 12 years. Although it has been generally taught that the external epicondyle appears between the twelfth and sixteenth years, it is concluded from this study that it is not constant as a separate epiphysis and its presence is the exception rather than the rule.

The other two centers of ossification at the elbow are the head of the radius and the olecranon. These make a total of six centers. The radial head has been noted at the age of 5 years and is constant at the age of 7 years. The olecranon is variable, appearing sometimes as early as the eighth year but not found constantly until the tenth year. At the latter age there are at times two shadows, one at the tip and one at the posterior portion of the olecranon, which suggest either irregular ossification or two centers.

Fusion of the humeral centers begins at about the twelfth year of age when the capitellum and trochlea unite with each other but not with the shaft. At the fourteenth year they are united with the shaft with the exception of the internal epicondyle which remains separate until the seventeenth year. The head of the radius and the olecranon are also united to their respective shafts at the fourteenth year. Beginning union of the olecranon has been noted at 13 years of age.

The variation in the time of appearance of the centers may be due to environment, diet, and the state of health.

The author comments on the discrepancies in textbooks and the literature on the subject of epiphyseal development and suggests that they may be due to the copying of errors from one book to another.

Another paper by the same author is forthcoming in which the clinical applications of these data will be discussed.

W. A. CLARK, M.D.

Kirschner: The Weight-Bearing Possibilities of an Amputation Stump (Zur Tragfähigkeit der Amputationsstümpfe). *Deutsche Ztschr. f. Chir.*, 1920, clvii, 326.

The author demands of a bone plastic the guaranty that a firm union will result between the boneplate and the cross-section of the bone. To obtain good weight-bearing function he recommends plugging of the marrow cavity.

The amputation is conducted in the usual manner as far as the exposure of the bone. The bone is sawed across about 1 cm. distal to an imaginary plane intended to be the ultimate end-section of the plastic. From the bone of the amputated portion of the extremity a conical plug to fit the marrow cavity is obtained. The cross-section of the thinner end of this plug is less, and the cross-section of its thicker end is greater, than that of the marrow cavity. The material for the bone plug is taken from the removed limb, either from the bone laid bare by the amputation or by a new incision. A particularly good source is the conical, thickened end of the fibula.

The plug is driven firmly into the bone with a hammer, only a small part being allowed to protrude over the sawed surface. When the bone is atrophic care is taken not to split it by hammering too hard. After the insertion of the plug, the periosteum is incised circularly at the level chosen as the end-surface of the plastic, and the bone stump with the contained plug is sawed across. After all sharp edges have been smoothed away and all spicules and bone dust have been removed, the stump is cared for in the usual manner.

In amputations of the leg below the knee Kirschner plugs only the tibia and saws away the fibula some centimeters proximal to this level in order that it may not be involved in the weight-bearing. The hardening of the stump is begun as early as possible. A temporary prosthesis is provided. Within a few

weeks at most the patient will be able to bear the weight of his body on a wooden surface which has been covered with a few folds of toweling. Subsequent X-ray examination will reveal no osteophyte formation, the outline of the bony stump remaining as smooth as at the time of amputation.

This procedure is practical only when asepsis can be maintained. Its advantages consist in the fact that the marrow cavity is closed off in a practical and effective manner without the use of any artificial substance and the bone plug with its lowered vitality prevents osteophytic outgrowths from the marrow cavity.

Later shifting of the plug as the result of bleeding, swelling of the marrow, muscle pull, or other mechanical factors is not apt to occur. No direct effect is exerted upon the bone marrow by the surface of the prosthesis.

VOLLEY (Z).

Anzoletti, A.: Analytical Considerations of Coxa Vara (Considerazioni analitiche sull' argomento della coxa vara). *Chir. d. organi di movimento*, 1921, v, 249.

In this exhaustive article Anzoletti analyzes coxa vara and the various treatments devised for it, especially Volkmann's immobilization and the continuous extension treatment of Codavilla and Losio following a primary osteotomy. After describing the typical femur he discusses the different types and degrees of varus. He then considers the treatments indicated by these types and how their requirements are met by the various methods. Codavilla treats severe coxa vara by a curvilinear paracervical osteotomy of the great trochanter, placing the patient in the Schede bed and applying continuous traction up to 60 to 80 kilos. Losio, who limits his traction to 16 kilos, claims equally good results.

Anzoletti concludes that in varus of the first degree an articular disinsertion in no way contradicts Codavilla's method. The damage which the violence of the extension causes will be restricted to the femoral head alone and later treatment may be expected to diminish it. In cases of the second degree of varus, and particularly those of the third degree, the chance of a good result from this method is opposed by: (1) the great resistance of the displaced ileo-femoral ligaments; (2) the abnormal fulcrum power exercised by the neck on the acetabulum which favors transverse fracture; and (3) the trophic malacia of the cervical neck which renders fracture inevitable. Therefore when in cases of the more marked grades of varus the polar point is outside the acetabulum Codavilla's method of osteotomy with excessive traction is not fully justified.

The older plaster-cast method of Volkmann replaces one deformity by another. The choice between the method of Volkmann with the plaster cast and Losio's method with limited traction is chiefly a matter of time. A case treated in adolescence by the Volkmann method with subcutaneous osteotomy

and all precautions to assure strict approximation of the stumps allows walking with crutches in six days, removal of the plaster cast to the level of the femoral condyles by the fifteenth day, and entire removal of the plaster cast within three weeks. When Losio's continuous traction not exceeding 16 kilos is used it will take eleven weeks after the primary operation before the limb is free and the patient is able to walk with a cane.

W. A. BRENNAN.

Gibson, A.: Some Aspects of the Mechanism of the Human Foot in Walking. *J. Orthop. Surg.*, 1921, n.s. iii, 188.

The foot is discussed as an organ of locomotion rather than a static organ. From this standpoint it should be regarded as composed of two springs placed side by side. The outer spring, which is short and stiff, takes the heavier work, while the inner spring, which is long and flexible, provides ease and flexibility.

In walking, the body weight comes first on the heel, then on the short, stiff outer spring, and finally is transferred to the long, flexible inner spring. The anatomical structure of these springs is described and the question of the proper height of the shoe heel is discussed. The author favors a heel of moderate height as it saves the muscles from lifting the entire body weight at every step.

The article gives a conception of foot action different from the static action usually described.

B. H. MOORE, M.D.

Ogilvy, C.: A Study of the Foot in Infancy and Childhood, with Special Reference to the Prevention and Treatment of Deformity. *Arch. Pediat.*, 1921, xxxviii, 275.

The author calls attention to the fact that birth deformities are numerous and far too little attention is paid to them although their correction is simple and their relief immediate.

Congenital club-foot should be treated as soon as it is recognized. The shortened structures on the inner border of the foot should be stretched twice a day for the first three days. After this, an adhesive plaster dressing is necessary to maintain the correction. Until the end of the first week the adhesive should be applied over a one-layer gauze bandage to protect the skin but after the third week it may be applied directly to the skin. Five strips of adhesive plaster, 1 in. wide and from 7 to 8 in. long, are applied as follows:

The first strip starts at the inner side of the ball of the great toe, passes under the foot, and is drawn up on the outside of the leg. The second overlaps the first slightly but is applied further back on the toe. The third is applied around the heel from the inner to the outer side and passes up the leg to the knee. The fourth strip is extended from the inner border of the foot across the sole and up the outer side diagonally over the ankle joint and then continued spirally about the leg. The fifth strip is

applied in the same manner as the fourth but starts further back toward the heel.

This dressing should be changed every five days. After six months a plaster of Paris dressing may be substituted. When the child begins to walk the outer border of the heel and sole of the shoe should be elevated $\frac{1}{4}$ in.

For the treatment of congenital calcaneus the author applies three strips of adhesive beginning at the toes and extending them up the center of the sole. Over the three strips a gauze bandage is applied which extends from the toes to the knee joint.

In cases of beginning foot strain in children attention must be directed to the shoeing. The proper shoe is a lace shoe which is broadest across the toe, has a straight inner line, and fits snugly over the dorsum of the foot and about the heel.

Cases of hereditary weak foot which cannot be cured by means of shoes or plates Ogilvy subjects to an arthrodesis of the astragaloscaphoid joint.

JOHN MITCHELL, M.D.

Clark, W. T.: Bloodless Surgery in Flat-Foot. *Med. Rec.*, 1921, xcix, 921.

In one hundred consecutive cases of falling of the arch the author found that the first cuneiform was responsible in the majority, the cuboid in the next greatest number, and both bones in the remainder. Malposition of the scaphoid due to falling of the first cuneiform is a frequent cause of falling arch.

Dropping of the tarsal bones causes pain which often is as severe as metatarsalgia. In this condition, with malposition of the cuboid, the bases of the fourth and fifth metatarsals articulate improperly with the cuboid and third cuneiform. Since the metatarsal heads are out of alignment agonizing pain results from their impingement upon the external branches of the anterior tibial and external plantar nerves.

Falling of the arch occurs gradually and results in pressure upon nerves, ligaments, tendons, inter-articular fibrocartilages, and muscles. Irritation and inflammation follow with the subsequent development of adhesions and permanent displacement.

Rupture of adhesions by slow pulling or twisting is prevented by the construction of the arch. It can be accomplished, however, by the frequent application of firm pressure over the plantar surface of the misplaced bone, the foot being held firmly in position and a sharp jerky blow being delivered over the dorsal surface of the metatarsals near the base with the palm of the right hand. Such manipulation must be followed by deep muscle massage.

Massage is essential to build up the natural arch support and prevent recurrence. In cases showing prominence of the extensors of the toes massage should be applied in a downward direction to the first phalanx. Bending the toes down gently but firmly should be practiced with the massage.

Patients who have worn arch supports may discontinue their use gradually. Arch supports give only temporary support at best. JOHN MITCHELL, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Oudard: Isolated Fractures of the Transverse Processes of the Lumbar Vertebrae (Fractures isolées des apophyses transverses des vertèbres lombaires). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 706.

Oudard gives short histories of seven unpublished cases of isolated fractures of the transverse processes of the lumbar vertebrae, five of which were cases of his own. In the literature he has found the reports of thirty-one cases published since the first case was described by Kalthoener in 1891. As a rule only one process is fractured. Multiple fractures are exceptional. In only one case was there a simultaneous fracture of both processes of the same vertebra. The first lumbar vertebra is most frequently involved and the fifth most rarely.

The lumbar nerves being in immediate contact with the anterior surface of the transverse process, injury of the process may cause persistent neuralgia.

Fracture may be produced by direct or indirect shock. A fall from a height on the feet or sudden and violent muscular contraction combined with fragility of the process may be responsible.

The constant symptom is pain in the lumbar region, and especially in the vicinity of the fractured process, which radiates to the upper and lower limbs, and is generally violent at the time of the injury and exaggerated by movement. There is also a characteristic attitude. The spinal column is in extension with inclination toward the side of the lesion and there is concave scoliosis of the injured side and an attitude of defence which causes relaxation of the muscles having their insertion in the injured transverse process. The symptoms may persist in some degree for months or years.

The prognosis of this type of fracture is unfavorable because of the possibility of associated visceral injuries, the persistence of neuralgia of the lumbar nerves, and the development of traumatic spondylitis.

In the treatment, immobilization in bed without plaster fixation or continuous traction appears to be sufficient. In some cases, however, adhesive applied around the body and exerting strong pressure on the fractured region seems to have a good effect. Operative treatment is indicated only when the fracture is complicated by infection or the severe pain persists and radiates along the course of the lumbar nerves.

W. A. BRENNAN.

Mauss, T.: Traumatic Injuries of the Spinal Cord and Their Treatment, with Particular Regard to Late Cases (Ueber die traumatischen Rückenmarksschädigungen und deren Behandlung, unter besonderer Berücksichtigung der Spätfälle). *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1921, lxxvi, 1.

On the basis of their etiology injuries of the spinal cord are direct or indirect. The first are due to

direct action on the cord or the spinal column and the second to contusions from a force outside the region of the spine.

On the basis of the pathologic anatomy cord injuries may be divided into primary and secondary. Primary injuries include partial or total crushing, disorganization of a cross-section of the cord, hæmatomyelia, myelomalacia, central necrosis, and conditions resembling disseminated myelitis or myeloencephalitis with symptoms resembling those of multiple sclerosis. To this group belongs also concussion of the cord. This condition, the histopathology of which is unknown, soon clears up.

Secondary injuries are characterized by processes which cause an increasing external pressure. Such pressure is exerted by bullets, bone splinters, the growth of callus following fracture of vertebrae or by pachymeningitis externa and arachnitis adhæsiva occurring conjointly or independently. Pachymeningitis externa is characterized by thick, epidural deposits which surround the dural sac for a distance of several centimeters and in some areas are closely adherent to the dura but in others may be detached from it easily. These indurations may be drawn so closely together that they cause an hour-glass constriction of the cord. In arachnitis adhæsiva the cord and root processes are surrounded by more or less delicate, white or whitish membranes. This condition leads to adhesions or agglutination of the arachnoid and not rarely to sacculation of the spinal fluid which compresses the cord like a foreign body. It should be borne in mind, however, that these conditions may be present without causing clinical symptoms.

On the basis of the clinical picture the author distinguishes three groups of spinal lesions: (1) lesions of the cord with the syndrome of total paresis; (2) lesions of the cord with the signs of partial interruption of conduction; and (3) lesions of the cord of the radicular (segmental) type. Total paraplegic lesions manifest themselves clinically by a complete flaccid paralysis, loss of the reflexes, absence of sensation to all stimuli below the point of interruption, functional disturbances of the urogenital tract, and a tendency to the formation of severe decubitus. The old theory that this Bastian-Brown syndrome is to be regarded as absolutely pathognomonic, however, is no longer tenable. Not a few cases have been observed which immediately after the injury showed the typical clinical picture of a total paraplegic lesion but within a few weeks or months showed extensive recovery or even after a year showed progressive improvement. Moreover, experience during the war demonstrated that the persistence of certain skin and tendon reflexes in cases otherwise typical of a total paraplegic lesion cannot be regarded by itself as proof of the absence of a complete anatomical interruption.

Lesions of the cord with partial interruption of conduction are characterized chiefly by the spastic character of the disturbances of motility. These cases may be divided into three groups: cases of bilateral spastic paresis, cases of unilateral paralysis of the Brown-Séquard type, and cases of unilateral paralysis of the cerebral type (Oppenheim). The latter differs from the paralysis of the Brown-Séquard type chiefly in the fact that the disturbances of motility and sensation are on the same side. In lesions of the segmental or radicular type one has to deal anatomically as a rule with processes which are either entirely of meningeal origin (pachymeningitis and arachnitis) and injure the cord only secondarily by pressure or stasis of the spinal fluid, or with processes which involve both the cord and meninges at the same time, but exert a greater effect upon the meninges. In the first type the root symptoms dominate the picture from the first, while in the second both cord and root symptoms are noted but gradually the root symptoms predominate. The author describes the symptoms associated with these types of involvement with regard to the different parts of the spinal cord and illustrates them with case histories.

The clinical symptoms are of little value as indicating the pathologic-anatomic basis of the injury. Quick and extensive disappearance of the signs of paralysis indicates first commotio spinalis. The isolated appearance of root symptoms or their marked predominance as compared with the symptoms of interruption of conduction in the cord speaks for an adhesive meningeal affection. The less the symptoms of compression the more probable it is that the lesion has an entirely or chiefly intramedullary situation. As regards the height of the lesion the author states that symptoms of irritability are to be interpreted with caution and root pains should be regarded of definite significance only when they show a certain regional constancy and correspond in some degree to objectively demonstrable segmental disturbances of sensation. More trustworthy are disturbances in sensation which often consist only in lessened sensibility. Disturbances of motility of the radicular type are generally of a degenerative atrophic type and characterized by various motor irritation symptoms. Of the reflex symptoms the most significant in the topical diagnosis are the tendon reflexes.

If the roentgen examination suggests the presence of a foreign body causing pressure on the cord an operation is indicated even when severe spinal symptoms are absent. If the roentgen findings are negative an immediate operation should be performed only if there is evident progress of the disease process or the appearance of bulbar symptoms. Otherwise a stationary period should be awaited, the patient being kept under observation.

In a series of cases reviewed the best results were obtained in the chiefly meningeal affections, particularly of the caudal region and the lumbodorsal cord. Relatively good results were obtained in the spinal hemiplegias of the cerebral or Brown-Séquard type. In cases of spastic paraplegias the results were doubtful. The results were poorest in cases of flaccid paralysis.

With regard to the extent of laminectomy one should not be too conservative. This operation permits examination, and by removing pressure and improving the circulation favors recovery. A defect of six or seven vertebral arches is not harmful. Sparse removal of the arches is necessary only in cases of fracture of the vertebral bodies. The dura should always be opened unless there is danger of infection. The cord itself does not regenerate but regeneration does occur in fibers of the posterior roots which may be cut between the cord and the spinal ganglion.

Cystitis should be treated by irrigation of the bladder, internal antiseptics, and autogenous vaccines. For decubitus the continuous bath is indicated. Spastic paralyses should be treated by manual massage to overcome the tension of the muscles and prevent contracture of the joints. If operative treatment is necessary simple section of tendons of single muscle groups is sufficient in cases of hypertonicity. In extensive spasms in the legs, and less frequently in the arms, the Stöfel operation is indicated. For severe and bilateral contractures the Foerster operation is usually to be preferred. However, if there is the slightest doubt regarding the presence of compression, the cord should be exposed immediately in the region of the lesion before resort is had to such a radical operation as radicotomy.

In the author's opinion the resigned attitude of Lewandowsky and many other neurologists toward the surgical treatment of severe vertebral and spinal cord lesions is unwarranted. WREDE (Z).

SURGERY OF THE NERVOUS SYSTEM

Lewis, D.: Nerve Injuries Due to Errors in Technique in Making Intravenous Arsphenamin Injections. *J. Am. M. Ass.*, 1921, lxxvi, 1726.

Accidents following intravenous injection of arsphenamin are not very common, but their occasional occurrence renders extreme care necessary in the administration of this drug. If the injection is made into, or even, near a nerve sheath, the nerve will be damaged and sloughing of the tissues may

occur to such an extent as to interfere with the repair of the injured nerves. Two cases of such injury are reported. Pain radiating into the fingers during the injection is a warning that the solution is not being injected into the vein.

In the first case reported the patient had had an injection of arsphenamin two years before. He had experienced pain in the distribution of the median nerve during the injection, and exhibited a typical

median-nerve palsy. At operation the usual neuroma was not discovered, but the proximal nerve was found to be enlarged for $1\frac{1}{2}$ in. and microscopic section showed scar tissue replacing the neuraxes. After the fibrous nerve was removed for $3\frac{1}{2}$ in. repair was effected. Four months later it was reported that the wound area had sloughed, contraction prevented extension of the forearm, and though slight sensation was returning there was no evidence of a return of motion.

In the second case an intravenous injection of arsphenamin was given in the right arm in September following a chancre in August. This caused immediate pain and swelling of the arm and hand. The following February partial paralysis was noted in the region of the ulnar and median nerves but by May of that year there was such improvement that operative treatment was not advised.

M. H. HOBART, M.D.

Wittenrood, A. C.: A New Method of Nerve Stretching in the Treatment of Sciatica (Eine neue Methode der Nervendehnung bei der Behandlung der Ischias). *Nederl. Tijdschr. v. Geneesk.*, 1921, lxx, 1403.

The author suffered from sciatica on the right side and noticed that when he lifted up his foot to change his shoes there was sharp pain along the course of the sciatic nerve irradiating into the calf. Stretching of the nerve occurs when the right heel is grasped with the left hand and the right ankle with the right hand and the foot is pulled upward. In this way the leg is rotated outward, abducted, and flexed. In experiments on the cadaver it was found that in this position the sciatic nerve is stretched tightly over the tip of the greater trochanter, being pushed outward by the quadratus femoris. Upon this finding the author has based the following method of treatment:

If the pain on spontaneous motion is especially great, massage of the buttock is first done for five to ten minutes on the external and posterior sides of the side affected with as much force as the patient can bear. The patient is then placed on his back and shown that the bending back of the flexed leg to the pelvis is not painful and that abduction of the extended leg is not particularly painful. Then both these movements are combined with rotation of the femur outward which causes quite severe pain in the buttock, thigh, and knee. After this, the leg is laid back in position. The patient is then instructed to pull his foot up himself; with each succeeding movement it must be brought nearer to the forehead.

The sound leg is left lying stretched out so as to fix the pelvis. After a few exercises the patient rises to a sitting position and, with his legs stretched, bends over and touches the toes. It is better to keep the legs stretched and not succeed in touching the toes than to bend the legs in order to touch them. After the exercises the patient is instructed to walk around with large steps lifting the affected

leg up and putting it down quickly. Then, while sitting on a stool of such a height that his feet rest flat on the ground and his thighs are horizontal, he must place the foot of the diseased side on the knee of the sound side so that the depression between the external malleolus and the heel lies on the knee to fix the position. This he must do without using his hands.

He must then bring his forehead down to the heel. This is rendered less difficult by practice in up and down movements of the upper part of the body and the head. The sound leg must not be moved back so as to relax the back muscles, and the diseased leg must remain in a horizontal position. It is easier to do this stretching in the sitting position than in the lying position as the latter makes it more painful.

The patient then stands and goes through certain exercises: (1) movements of the trunk forward, backward, and to the side without bending the legs, (2) bending over and touching the floor with the fingers without bending the legs; and (3) touching the outer border of the well foot with the fingers of the well side so that the sound leg is flexed and the diseased leg is extended.

These lying, sitting, and standing exercises must be done every morning, noon, and night for a quarter of an hour, in the open air if possible. The patient should never sit still in the house more than half an hour; after that length of time he must walk up and down a few minutes. The evening exercises should be done just before going to bed as it improves sleep.

Attention to the bowels is of importance. The active and passive movements of the limbs should never be violent. Anxious patients with chronic diseases often perspire, tremble, and show reflex muscle tension even when they are merely examined. This cannot be overcome by force; psychic treatment is necessary. The prejudice against immediate mechanical treatment in acute sciatica must be given up. In chronic sciatica, neuritis is not a contra-indication.

In twenty years' use of the method described, not one acute case has become chronic. The author does not employ an anæsthetic as this would make it impossible to judge the degree of the stretching by the amount of pain it caused. He has had improvement by the method described in the pelvic neuralgia of pregnant women and in cases of pain during the menstrual period. Recurrences, which are seldom observed, are due mostly to rheumatic disease; as a rule the attacks can be stopped by stretching exercises. Neuralgia of the perforating cutaneous nerve often simulates sciatica; massage is the best method of overcoming it.

Points in the diagnosis of sciatica are: (1) general pain on abduction, rotation, and flexion; (2) typical pain points in the greater sciatic foramen; and (3) the character of the irradiation of the pain along the nerves of the knee, the calf, and the upper outer side of the foot.

TIMM (Z).

Gibson, A.: The Importance of Precise Anatomical Knowledge in the Surgery of the Peripheral Nerves. *Canadian M. Ass. J.*, 1921, xi, 401.

The author states that if anatomical continuity of the fibers of a divided peripheral nerve can be obtained without tension a successful result is to be expected. If it cannot be obtained without the interposition of scar tissue or undue tension, the results will not be favorable. One outstanding lesson of nerve surgery is the importance of a knowledge of normal anatomy, and another, the importance of long incisions.

It is a matter of clinical experience that suture of the musculospiral nerve has a rather better prognosis than that of many other nerves. On the other hand, the results of suture of the posterior interosseous have been uniformly disappointing. When it is necessary to suture a nerve just above its division into a number of branches, the outlook is not very good.

Gibson explains at some length the mechanism involved in the production of the claw-hand found in ulnar lesions. In conclusion he describes a case in which he successfully anastomosed the central end of the hypoglossal nerve to the distal end of a severed facial nerve.

FREDERICK CHRISTOPHER, M.D.

Babcock, W. W.: The End-Results in 608 Cases of Peripheral Nerve Injury. *Pennsylvania M. J.*, 1921, xxiv, 533.

In 608 cases of peripheral nerve suture the authors were confronted with all the handicaps incident to war wounds. Anatomically these were associated injury or infection of bone, loss of soft tissue, atrophy, fibrosis, adhesions, deformed healed or unhealed wounds, and at times deep foci of infection due to a foreign body. The physiological handicaps were ankylosed joints and wasted and fixed muscles.

The operations were preceded and followed by elaborate tests conducted by experts in neurology, physiotherapy, and orthopedic surgery.

The indication for operation was a persistent total or partial interruption or a serious irritative lesion.

Following neurolysis the nerve bundles were carefully surrounded by muscle and the wound sutured without drainage. The results in these cases were better than those in similar cases treated by physiotherapy alone.

Hersage was limited to nerves in which the fibrosis did not produce complete anatomical block. In 75 cases this method was a complete failure in 20 per cent but caused improvement in 54 per cent, decided improvement in 16 per cent, and a cure in 10 per cent. In contrast to this series with improvement in 80 per cent was a series of 142 milder cases treated by physiotherapy in which improvement resulted in only 67 per cent. By January, 1920, only 14 per cent of 169 cases of hersage showed no improvement.

In the suturing of nerves the nerve ends were cut squarely with a sharp razor blade until well-formed

bundles were seen. They were then accurately aligned and united with interrupted sutures of Aoooo black silk going through the sheath. Only 8 of 182 cases of suture failed to show signs of regeneration. In each of these a mechanical reason was found for the failure of regeneration.

With regard to infection the author states that as peripheral nerves have tough sheaths and an independent blood supply, they are resistant to trauma and infection. Infection sufficient to prevent union of tendons, muscle, or adipose tissue may fail to prevent union of sutured nerves. Palsy is a rare complication of infection spreading to an uninjured nerve. Of 14 cases of wound infection following nerve suture the nerve was found to have been separated in only 1 case. The danger of infection to nerves is greater after a primary suture than in nerves which have acquired a certain degree of resistance from previous infection. Infection in an unhealed wound is more easily handled than deep infection in a healed wound. Twelve previously infected wounds healed by primary union, 1 continued to suppurate, and in 1 a slight superficial infection persisted.

In 12 old wounds which were apparently healed soundly the operation lighted up a suppurative infection.

The authors oppose the British method of delaying operation for one year because in that period of time extensive degeneration of nerve and muscle may make an operation useless.

With regard to the treatment of large defects in nerves the following statement is made:

"We would express the law which we think has few exceptions, that when a nerve is so extensively destroyed by injury that the ends cannot by any manipulation be brought together, then the limb will be found so disorganized that a nerve suture would be of no avail. As a corollary: when we fail as surgeons to do an end-to-end anastomosis of a divided nerve we have failed to use the full measures of our art." The only recourse in such cases consists of the utilization of the normal slack in the nerve plus that obtained by slight traction, flexing, extending, rotating, or abducting adjacent joints, and in some instances re-routing the nerve to give it a shorter course.

J. J. LEBOWITZ, M.D.

Stoffel: Treatment of Large Nerve Defects (Behandlung grosser Nervendefekte). *Zentralbl. f. Chir.*, 1921, xlviii, 667.

In the treatment of large nerve defects the author makes use of the elasticity of the nerve by passing a heavy silk suture transversely through the cicatricial portion, as in tendon suture, and with this suture uniting the nerve ends under tension with favorable posture of the limb. The nerve is then surrounded with calf peritoneum to facilitate its recognition later and prevent adhesions. During the next two or three days the position of the joint is changed every two hours so that finally the extreme opposite posture is attained.

When the wound is reopened the nerve is easily recognized by reason of its covering and is found to be much lengthened and not adherent. Amputation of the stump and nerve suture are then accomplished. In one case of complete paralysis of the arm due to a gunshot wound of the axilla which left defects of 7, 3, and 4 cm. respectively in the median, ulnar, and musculocutaneous nerves despite mobilization, stretching, and the most favorable position of the joint, the ends were easily united by the method described and the nerves ultimately regained their function.

STRAUSS (Z).

Dane, P. G.: *The Results of Ninety-Eight Cases of Nerve Suture.* *Brit. M. J.*, 1921, i, 885.

This article is based on ninety-eight unselected cases of nerve suture from the massage department of No. 5 Australian General Hospital, Melbourne. All were cases of gunshot wounds. The patients have been under observation from one to three years. The standard of recovery was motor recovery since this is more important from the practical point of view than sensory recovery. Sensory recovery, however, was more complete and occurred earlier than motor recovery.

On the basis of the results the cases are divided into four classes: perfect, good, fair, and poor. Patients with perfect results have full motor and sensory recovery; those with good results have motor recovery of muscles subserving gross movements but not of those subserving finer movements; those with fair results have recovered function to a limited extent; and those with poor results have no recovery of function.

A table shows the relative frequency of the nerves involved as follows: ulnar, 35; sciatic, 22; median, 20; musculospiral, 15; brachial plexus, 5; and musculocutaneous, 1. Perfect recovery was obtained in 25.5 per cent. The group of perfect and good recoveries totals 51 per cent as opposed to

49 per cent in the group of fair or poor recoveries. Each case, however, must be considered by itself. In the majority of instances many of the muscles remain weak and atrophic. This is due to many factors such as concomitant injury to blood vessels or to other nerve trunks, sepsis, and improper preoperative and postoperative treatment.

The statistics presented by Dane do not compare favorably with certain others given in the literature. The results as a whole are somewhat disappointing considering the regenerative power of the axis cylinders, but are encouraging when one considers the many factors unfavorable to success. The factor of the time interval between the injury and the nerve suturing is difficult to evaluate. Some patients operated on immediately progressed poorly while others operated on after several months progressed well.

Most of the failures were due to neglect in preoperative and postoperative treatment with splints. The character of this treatment is of special importance in the small intrinsic muscles of the hand where recovery is difficult because of the small size of the muscles and of the nerve filaments which supply them, the distal location, and the contracture of antagonistic groups.

In the postoperative treatment of nerve suture electricity is loosing favor. A degenerated muscle is in a state of fibrillation and violent electrical stimuli should not be applied. Experimental work by Hartman and Blaky has shown that massage and galvanism have no effect in preventing atrophy of muscles. Perfect rest and gradual re-education of muscles is of great importance.

With regard to sensory recovery, the author's experience has been that it is practically never perfect. In a great many cases partial sensation returns and this is advantageous to the patient in protecting him from burns and other injuries. Sensory return leads indirectly to a better condition of nutrition.

MERLE R. HOON, M.D.

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Kettle, E. H., and Ross, J. M.: *A Contribution to the Study of the Endotheliomata.* *Lancet*, 1921, CC, 1012.

The types and nature of tumors diagnosed as endotheliomata vary according to the observer. An attempt was therefore made by the authors to arrive at a basis on which a more reliable diagnosis can be made. Angiomata were chosen for the study reported because they are undisputably of endothelial origin, and the behavior of the neoplastic endothelial cell was observed.

Tumors of endothelial origin can be recognized as the cells composing them invariably revert to the primitive vasoformative type. This reversion

adequately explains the structure and growth of such neoplasms. The mode of growth, as in the primitive vasoformative cells, seems to be proliferation of the tumor cells and their extension as buds or processes into the neighboring connective tissue. Later they become vacuolated and the vacuoles of adjacent cells coalesce and establish communication with the parent capillary. The nuclei with the remnants of cytoplasm form an endothelium to the newly formed vessel.

More complicated tumors than the angiomata were studied but a full report of these is not included. The mere relation of the tumor cells to the blood vessels or circulating blood is not a satisfactory basis for a diagnosis of endothelioma. Polymorphism of endothelial cells may exist but there is no evidence that the cells of an endothelioma can so

closely resemble those of a carcinoma or sarcoma as to give rise to confusion. When such resemblance occurs it is no longer possible to establish the endothelial origin of the neoplasm and it should not be included among the endotheliomata.

G. S. FOULDS, M.B.

Owen, L. J.: Multiple Malignant Neoplasms. *J. Am. M. Ass.*, 1921, lxxvi, 1329.

Among 3,000 cases of malignancy Owen found 143 cases (4.7 per cent) of multiple growths. The cases recorded are those in which there were multiple malignant growths of the same type or of different types. In the majority of cases the neoplasms were present simultaneously, but in some there was a sequence of development, the first growths having been successfully treated.

The basal-cell type of squamous-cell cancer is the most common of the multiple malignant growths and occurs more frequently than is indicated by the 86 cases collected. This type usually occurs on the face, and rarely below the level of the lips. In 20 cases of single or multiple basal-cell carcinomata the patient had also a prickle-cell cancer or a cancer of the mucous membrane.

Seven cases showed more than one prickle-cell-cancer or multiple squamous-cell carcinomata of mucous membrane origin.

Another group comprised 14 cases of bilateral cancer of the breast. The duration of the disease varied from one month to seven years. The average time of growth was twenty-four months.

Ewing states that bilateral carcinoma of the breast is not uncommon, but that simultaneous occurrence is rare. This was noted in 4 cases (28 per cent). All of the cases of this group belonged to the adenocarcinoma type of growth.

There were 5 cases of carcinoma of the breast with neoplasms having their origin elsewhere. Two cases presented tumors of the breast and cervix at the time they were admitted to the hospital.

The time which must elapse after treatment of a malignant disease before it is justifiable to conclude that a cure has been effected was extended first from one to three and later to five years or more. The author believes, however, that many recorded metastases or residual growths from neoplasms previously treated are new foci of growth.

A patient who has apparently been treated successfully for a malignant disease is not immune to the growth of further neoplastic tissues. If the origin of his tumor was an embryonic rest, he may have many more such rests in his body. If the important etiological factor is specific cancer infection — an organism — re-infection is possible.

H. A. MCKNIGHT, M.D.

Shannon, J. W.: The Essential Factors of Cancer Causation. *Boston M. & S. J.*, 1921, clxxiv, 505, 542, 572, 608, 632.

The author states that the stimulus which causes the cells of the body to depart from their normal

development and reproduce themselves in excess of the normal requirements of the body is a stimulus of fertilization which is distinct from that causing normal growth.

It is evident that the essential factors in the problem of cancer are four, namely, the fertilizing agents, the living tissue cells, lesions, and water. The fertilizing agents and the living tissue cells are of theoretical importance only, but lesions and water are necessary for the explanation of all the practical problems of cancer causation and prevention. By "lesion" is meant a breach or defect in the protective surfaces of the body, and by "water" is meant unsterilized water.

Surface water may be divided into three types according to the number of protozoal organisms in it. From the Mortality Reports of the United States Bureau of the Census the author finds that in those States in which cancer is most prevalent there is more water of the stagnant type in which the maximum numbers of protozoal organisms are found. He has noted also that where the mean annual temperature of the water is greatest the incidence of cancer is least. This is explained, he believes, by the fact that increased temperature lowers the viscosity of water and protozoal organisms cannot maintain themselves at the surface of waters of low viscosity. Cancer incidence varies about inversely with that of typhoid, a water-borne disease due to pathogenic bacteria. Where protozoal organisms predominate it seems probable that they have destroyed the bacterial organisms.

In examining the organs affected by cancer the author found that 83.1 per cent of all cancers appear in structures which together constitute only a small part of the body, namely, in the skin, the female breast, and the alimentary and female generative systems, only 16.9 per cent being distributed among all the other structures of the body. This distribution coincides with the sites at which there is a co-operation of lesions with water, and perhaps, in fact, where water is longest in contact with a lesion. The apparent immunity of the Japanese, who bathe a great deal, to skin cancer is due possibly to the fact that the bathing is done in water of much higher temperature than elsewhere and therefore sterile or nearly sterile.

In conclusion the statement is made that if the causative agent of cancer is conveyed to the body in water the boiling of water used for drinking, washing, and bathing should prevent the disease.

FREDERICK CHRISTOPHER, M.D.

Gundermann, W.: Air Embolism (Ueber Luftembolie). *Mitt. u. d. Grenzgeb. d. Med. u. Chir.*, 1921, xxxiii, 261.

The entrance of air into the heart occurs through the venous system. There are four paths of entry: the intercostal veins, the bronchial veins, the pulmonary veins, and the extrathoracic veins. From the point of entry the air goes to either the left or the right heart. The intercostal and extrathoracic

veins lead the air into the right heart, while the pulmonary veins carry it into the left heart and the bronchial veins carry it into both halves of the heart.

From the left heart even very small amounts of air may be fatal by causing embolism of the coronary arteries. In such cases death occurs through asystole, respiration ceasing later. It has been said that death is too sudden for brain embolism to be its cause. Nevertheless it has been proved that death may occur from brain embolism.

The distant murmur does not occur when the side of the heart involved is the left side, but now and then a low tinkling sound is audible for a moment. Accordingly, the distant murmur is of value in the differential diagnosis as it is pathognomonic for air embolism in the right heart.

The symptoms of air embolism in the left heart are few. There is merely slowing of the respiration. Death occurs suddenly. The right heart endures a greater ingress of air than the left. The continuous aspiration of air through a pulmonary vein plays a fatal rôle. Any further diastole with its suction effect and any inspiration may be fatal.

When the right heart is involved, postural therapy is of some benefit. It should be kept in mind that empty veins aspirate air much more easily than those well filled with blood. For this reason the field of operation should not be higher than the heart. We can take no steps against embolism of the left heart. Small amounts of air in the right heart are not dangerous but larger amounts endanger life by embarrassing the pulmonary circulation. Following death from air embolus in either the right or the left heart all attempts at resuscitation are in vain. They are rendered futile by the action of the left ventricle which remains flaccid. The over-distended right heart often still continues to contract weakly a few times. The empty left heart, on the other hand, will continue to contract when massaged but the coronary vessels receive no blood and the heart cannot again take up its work because it receives no further nourishment.

COLLEY (Z).

SERA, VACCINES, AND FERMENTS

Mackenzie, G. M., and Leake, W. H.: The Relation of Antibody and Antigen to Serum Disease Susceptibility. *J. Exper. M.*, 1921, xxxiii, 601.

The authors state that Longcope and Rackemann have reported observations on the precipitin, anaphylactic antibody, and cutaneous hypersensitiveness in persons to whom serum had been administered therapeutically. In the course of these studies two patients were encountered who did not develop serum disease. It was found that in these cases no precipitin was demonstrable in the blood.

The studies reported in this article were undertaken by the authors with a three-fold purpose: (1) to pursue further the investigation of the relations between precipitin formation and the

symptoms of serum reactions; (2) to determine whether or not the disappearance of horse serum from the circulation can be brought into relation to precipitin formation or the symptoms; and (3) to investigate further the factors concerned in the non-susceptibility of certain persons to serum sickness.

The presence in the patient's serum of the anti-pneumococcus or antimeningococcus horse serum, which the authors refer to as "precipitinogen," was determined by specific precipitation with the serum of rabbits immunized against horse serum. For their experiments this anti-horse rabbit serum was used in all the tests without inactivation and without preservatives, but was diluted with an equal volume of normal salt solution. Each day on which tests were made the rabbit serum was titrated against dilutions of normal horse serum, and to insure the specificity of the reactions it was titrated against several dilutions of normal human serum. However, because of the frequent occurrence of prozone phenomena, it was found necessary to set up several dilutions of each of these controls as sometimes an anti-horse rabbit serum which gives no precipitation when diluted with human serum will give a definite clouding.

In the determination of precipitinogen another possible source of error which must be guarded against was encountered. It is well known that an immune serum may contain both precipitin and precipitinogen without forming a precipitate, but if two such sera are mixed, precipitation follows. In determining the titer of precipitinogen in the patient's serum, therefore, it is important to use only immune sera which have been tested and found to be free from precipitinogen.

Studies on 19 patients to whom foreign serum had been administered for therapeutic purposes are reported. Analysis of the results obtained by following the precipitinogen in the circulation and comparing these factors with the time of appearance, intensity, and duration of the symptoms shows that the 19 patients fall into three groups.

The first group included 11 patients. These were good precipitin formers. They had severe serum disease, and the precipitinogen disappeared from the circulation at about the time the symptoms subsided.

The second group included 4 patients who had little or no serum disease, in whose circulation little or no precipitin was demonstrable, and in whom the precipitinogen persisted in the circulation as long as the patient could be kept under observation—from fifty-two to sixty-seven days.

The remaining 4 patients formed a more or less distinctly intermediate group.

The results lend further support to the conception of serum disease as an antigen-antibody reaction.

The possibility that the results indicate a factor which may be of importance in the mechanism of natural immunity is discussed.

G. E. BEILBY, M.D.

Armstrong, G. E.: Immunity in Surgery. *Surg., Gynec. & Obst.*, 1921, xxxii, 399.

Two of the three fundamental problems of surgery, the application of the ligature and anæsthesia, are established on a fairly satisfactory basis. The third, immunity, demands further study and investigation.

It is a mistake to define immunity as merely purposeful protection, as has been done in the past, for not all immunity reactions are protective. It is more nearly correct to define it as the sum-total of all interactive processes which occur in an organism when it is resisting an invasion.

Ehrlich believed that immunity reactions are entirely chemical. He regarded the toxin of bacteria as a definite chemical compound which is neutralized in the same way as an acid is neutralized by an alkali or by another chemical compound, the antitoxin, which is manufactured by the body cells. It is now known that toxin antitoxin reactions are extremely complicated colloidal reactions and that toxins and antitoxins themselves are very complex. Toxin antitoxin union is dependent upon the physical character rather than upon the specific chemical reactions of the two substances. Therefore, immunity reactions are only relatively specific.

Two other important immunity reactions have recently acquired a different explanation and significance—chemotaxis and phagocytosis. Metchnikoff believed that phagocytosis, the ingestion and annihilation of bacteria by cells, is the principal method of cell defense, while the research of Wright led him to the conclusion that differences in phagocytic action depend upon the presence or absence of specific substances, opsonins, which prepare foreign particles for ingestion by the phagocytes. We now know that movement of, and ingestion by, cells are essentially surface tension phenomena. Cells suspended in a medium behave as drops of colloids, and their movement and ingestion of foreign particles depend upon physical changes in their environment rather than chemical affinity.

It is probable that the multitude of immunity reactions which were formerly believed to be due to specific chemical substances and processes and suggested numerous hypothetical substances and complicated reactions may ultimately be grouped and explained by the general laws of colloidal relations.

SAMUEL KAHN, M.D.

Gurd, F. B.: Reactions to the Parenteral Introduction of Horse Serum in Man. *Arch. Surg.*, 1921, ii, 409.

The clinical phenomena which are grouped under the heading of "serum sickness" are manifestations of intoxication or irritation of the body tissues due to an alteration in the character of the injected serum protein molecule. This alteration of the molecule is due to the activity of specific substances present in the tissues and body fluids. The stimulation necessary for the elaboration of such specific substances is a previous exposure of the tissues to the same protein.

The alteration which takes place in the injected protein molecule—perhaps a cleavage of the molecule—results in a product which is extremely irritating to the tissues and especially to the involuntary muscle.

The animal or person whose tissues are hypersensitive to a specific protein is said to be "anaphylactic." When the reaction which occurs as the result of the interaction of injected protein and anaphylactic substances takes place in fulminant fashion, the phenomenon is known as "anaphylactic shock." When, in consequence of either incomplete hypersensitiveness, small dosage, or gradual exposure of the injected serum to the anaphylactic bodies, the reaction is more gradual in onset and less severe, the condition is sometimes referred to as "subacute anaphylaxis."

In the human being it is this less severe and more gradual type of reaction which is usually encountered. The term "allergy" is ordinarily used to designate the focal visible reaction which occurs at the site of introduction of the protein antigen in sensitive persons. The manifestations as ordinarily seen in man are:

1. An inflammatory reaction—mild to moderately severe cellulitis—at the site of injection. This may be accompanied by lymphangitis and lymphadenitis.
2. Pyrexia, with accompanying headache and anorexia and an accelerated pulse rate.
3. Skin eruptions, commonly of an urticarial or erythematous type.
4. Joint pains, presumably due to swelling of the synovial membranes.
5. Occasionally, though rarely, accompanying the general urticaria and oedema of the skin, oedema of the larynx.
6. In nearly all cases the presence of albumin in the urine for a short period. On this point sufficient data are not available.
7. Leucocytosis, which may be marked, during the stage of pyrexia. When the reaction occurs immediately after the injection, leucopœnia is noted. It is not improbable that a similar leucopœnia occurs early in the reaction period in cases which later show a leucocytosis.

In hypersensitive persons an immediate reaction takes place. The manifestations of this are:

1. The focal inflammatory reaction at the site of the injection is more severe and occasionally results in suppuration or even necrosis of tissue.
2. There is often a feeling of fullness or pain in the epigastrium.
3. Vomiting and diarrhœa occur, the latter often being bloody.
4. There may be marked splanchnic dilatation as evidenced by collapse, a drop in the blood pressure, and tachycardia. Examination of the blood reveals concentration. Such an effect may result ultimately in the complete arrest of the circulation and death.
5. There may be marked dyspnœa accompanied by cyanosis and a choking sensation. Death may

supervene from arrest of respiration. In exceptional cases following an immediate splanchnic reaction with subsequent more or less complete apparent recovery, a recurrence of the collapse state which may end in death may occur after the lapse of some hours.

Hypersensitive persons may be desensitized so that large amounts of serum may be injected without danger. The method of desensitization employed by the author is described.

Avoidance of reaction is of greater value than treatment. In all suspicious cases the absence of hypersensitiveness should be proved by means of an intradermal test prior to the injection of serum for prophylactic or therapeutic purposes. If the patient is found to be sensitive he must be desensitized.

In cases of severe reactions treatment must be undertaken promptly and pushed to the utmost. The author discusses the various procedures which apparently have been proved to be of value.

SAMUEL KAHN, M.D.

BLOOD

Taddei: A Case of Hæmorrhagic Leukæmic Infiltration into the Muscles of the Thigh (Di un infiltrato leucemico emorragico nei muscoli della coscia). *Riforma med.*, 1921, xxxvii, 505.

A woman of 28 had an indolent painful swelling of the upper third of the inner surface of the right thigh, an enlarged and very hard spleen, and an enlarged liver. There was a prominent venous network in the inguino-crural region. The blood count showed 3,440,000 red cells, and 192,000 white cells. The hæmoglobin content was 55 per cent. There were many myelocytes of various types, hyaline, granular, eosinophile, basophile, and large mononuclears. This was evidently a case of myeloid leukæmia.

Banti has pointed out that myeloid leukæmia may give rise to metastases. The enlargement of the liver is due to infiltration of leukæmic tissue into the hepatic parenchyma, and the retinitis to leukæmic infiltration into the retina. There may be leukæmic infiltrations also into the skin and subcutaneous tissues giving rise to the so-called sarcoid tumors. There is a marked tendency of the newly formed tissue to infiltrate the vessel walls, push up the endothelium, and even cause ulcers.

In the case reported the swelling was due to leukæmic infiltration of the muscles of the thigh. There had been a hæmorrhage due to trauma but this had been absorbed. That the swelling was not a simple hæmatoma was shown by the fact that there was marked hypotrophy of the leg and the lower part of the thigh. The patient also showed a pronounced tendency to hæmorrhage; she had epistaxis, bleeding from the gums, and even hæmoptysis, though examination of the thorax was negative. This form of leukæmia is almost invariably fatal.

A. G. MORGAN, M.D.

BLOOD AND LYMPH VESSELS

Bonnet, P., and Barbier, L.: Secondary Ruptures of the Internal Mammary Vessels in Fractures of the Sternum (Les ruptures secondaires des vaisseaux mammaires internes dans les fractures du sternum). *Lyon chirurg.*, 1921, xviii, 207.

Rupture of the internal mammary arteries and veins is a rare complication of fractures of the sternum. The authors deal only with rupture secondary to fracture. They report two such cases observed during the war. In the first case rupture of the internal mammary artery was observed clinically following a sternal fracture but the authors are unable to affirm definitely that the vessel was not damaged by the original injury. In the second case the vessels apparently remained intact at the time of the injury, but rupture of the internal mammary artery occurred on the fifth day following an effort and the patient died two days later. Autopsy showed a hæmothorax undergoing purulent change.

The authors believe that secondary hæmorrhages of the internal mammary vessels may be due to traction on vessels left intact by the original injury. In their opinion this hypothesis is preferable to the assumption that they are caused by overriding of the fragments or the action of a bone spicule for in fracture of the sternum the tendency of the sternal fragments is to separate rather than to override. Therefore rupture of the vessels must be due to this separation. In experiments to test their theory they observed, first, rupture of the collateral vessels, and then, when the separation was increased, rupture of the main arterial trunk itself. The anatomical attachments of the internal mammary artery to the sternum show that its elasticity is very limited. Therefore the possibility of such a secondary complication in transverse fractures of the sternum is always present. The same is true with regard to resections of the sternum.

W. A. BRENNAN.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Bensaude, R., and Lelong, M.: Two Modifications to Facilitate the Technique of Œsophagoscopy: The Jointed Œsophagoscope and the Ventral Position (Deux modifications destinées à faciliter la technique de l'œsophagoscopie, l'œsophagoscope à crémaillère et la position ventrale). *Presse méd.*, Par., 1921, xxix, 413.

In the authors' modification of Bruening's œsophagoscope the single internal tube is replaced by an inner tube of several separate segments fitting into each other, and the external handle which moves the inner tube is replaced by a screw and ratchet arrangement somewhat similar to that of a microscope. After passage through the external tube the segments of the inner tube which move by ratchet can take different directions from the external tube.

An œsophagoscopic examination in the ventral position, another modification of technique suggested by the authors, is made in three stages corresponding to the three principal directions of the œsophagus. In the first stage the tube is ascending toward the patient's back, in the second stage it is horizontal, and in the third stage it should descend toward the abdomen.

The ventral position is often sufficient to assure drainage of the saliva and of fluids contained in the œsophagus. However, in cases in which the fluid to be evacuated is very abundant the best apparatus is a water tube or an electric aspirator. The authors use an aspirator similar to that employed by surgeons to aspirate the blood from the wound in facial operations. This consists of a centrifugal pump attached to a motor the speed of which is regulated by a rheostat. There is always a sufficient vacuum to aspirate every drop of fluid and keep the visual field continually dry.

In the authors' opinion the technique of choice for œsophagoscopy is examination in the ventral position with the ratchet and screw œsophagoscope. This is the most suitable method for the operator and the least disagreeable for the patient, especially when it is a matter of examining the cardia and the lower part of the œsophagus. The ventral position enables the operator to dispense with the services of an assistant.

W. A. BRENNAN.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Demel, R.: Vessels of the Dura Mater and Their Relation to the Formation of the Sulci Arteriosi (Die Gefaesse der Dura mater encephali und ihre Beziehung zur Bildung der Sulci arteriosi). *Arch. f. klin. Chir.*, 1921, cxv, 714.

In the autopsy on a man 82 years of age the skull was found to be hollowed out to a depth of $4\frac{1}{4}$ cm. by the course of the middle meningeal artery so that it seemed as if a finger laid on the proper spot during life would have felt the pulsation of the vessel. Because of this finding the author made a study of the dural vessels at different ages and compared their structure with that of the peripheral arteries.

With the exception of the elastica interna, the intima of the peripheral vessels seemed thicker than that of the dural vessels. The dural vessels were found to lack the longitudinal elastic bundles extending inward from the intima. On the other hand, the elastica interna of the arteria meningea is two or three times as thick, and at times appears as if doubly lamellated. The elastic elements of the intima are accordingly more strongly developed and able to withstand greater mechanical action than the elastica interna of the peripheral vessels.

The media of the dural vessels in comparison with that of the peripheral vessels is relatively poor in elastic elements. Moreover, an elastica externa is either absent in the dural vessels or only very

weakly developed. The adventitia contains no elastic elements. In deep sulci arteriosi the elastic elements of the elastica externa are less strongly developed than in cases in which the sulci are less distinct. Functionally, the thickness of the elastica interna is explained by the fact that the latter suffers the first onslaught of the blood wave and consequently must be most strongly developed. The weak development of the elastica externa is due to the stiff backing the vessel receives from its firm embedding between the bone and the dura which prevents dilatation.

It was found that the sulci develop during the second half of foetal life and that the degree of their depth at the different ages is variable.

The essential factors in the development of the sulci arteriosi are therefore:

1. The paucity of elastic elements in the outer coats of the dural vessels.
2. The firm fixation of the dural vessels to the bone due to their relation to the dura mater and the relation of the dura to the skull bones.
3. The acuteness of the angle of branching of the middle meningeal or internal maxillary arteries from the external carotid with regard to their approach to the straight line of the stream bed.
4. The effect of the centrifugal impetus of the blood wave in the vessels conforming to the concavity of the skull.

KAERGER (Z).

ROENTGENOLOGY AND RADIUM THERAPY

Schmitz, H.: The Relation of the Science of Physics to Radiation Therapy. *Am. J. Roentgenol.*, 1921, n. s. viii, 285.

Much of the progress in radiation and roentgen therapy has been made possible by the co-operation of the sciences of physics, chemistry, and medicine. A biological unit of dose has been defined, measuring instruments have been perfected accurately to gauge the dose, and clinical investigations have progressed so far that lethal dosages for normal and abnormal tissues have been established.

During the last year the author had the opportunity to observe the radiation investigations done in England, France, and Central Europe. Of the varied research carried on he deems most important that which is concerned with the measurement of radiation. These investigations he explains in detail.

Brief reference is made to an electrometer devised by Szilard which permits the measurement of radiation units. Friedrich perfected a modification of this which makes it possible to insert the measuring chamber into the body cavities and water phantoms and thus measure the radiation intensities actually obtained at the seat of the lesion. Tables are given showing the intensities of radiation at various distances from the source. The therapeutic application of these values has been worked out by Opitz and Friedrich. The tables and figures show the dosages at various distances for an hour's application.

To apply the results obtained to therapy it was necessary to ascertain a biological unit of dosage. This unit is the dosage necessary to produce a mild inflammatory change in the normal skin characterized by the appearance within eight to ten days after radiation of an erythema and subsequent desquamation, and after three to four weeks by epilation and brownish discoloration of the skin area. It is termed an "erythema dose" and is the standard of comparison for all tissues and radiation reactions. Comparative doses to produce definite changes in other normal and abnormal tissues have been determined and are discussed in detail.

Close application of the results of the experimental studies permit accurate knowledge of what may be expected in any given condition. In the treatment of uterine cancer with radium applied locally it may be impossible to effect the degeneration or death of all carcinoma cells without causing irreparable injury to some of the surrounding structures, and it may be necessary to supplement the local radium therapy by other means such as the application of the roentgen ray. The author has measured the roentgen-ray intensities at different levels and shows such values graphically. By combining the use of radium and the roentgen rays keeping in mind the total effect of the combined radiations, it is possible to cause destruction of certain organs without endangering others.

The exhaustive research on radiation intensities carried on by the physicists has enabled the clinician to work out a technique which conforms to the most important requirement of cancer therapy. The carcinoma must be traversed by a homogeneous radiation intensity which will bring about degeneration of all the cancer elements without causing irreparable damage to the vital structures contained within this area. The future will tell us whether by this technique the prognosis of cancer will be improved. The primary results obtained are better than those from the use of radium alone.

ADOLPH HARTUNG, M.D.

Stevens, R. H.: Some Points in the Radiotherapy of Deep-Seated Cancer. *J. Radiol.*, 1921, ii, 21.

The author discusses the various parts of the equipment used and calls attention to needed improvements in the apparatus and technique. He describes several accessories he has devised himself, such as a special wooden tube holder and a timer with an automatic switch. He believes that wider knowledge of dosage, filtration, and the susceptibility of the different types of malignant cells to roentgen rays of different wave lengths is imperative.

In reviewing the results of seventeen years' experience with radiotherapy, Stevens finds that only a few patients with deep-seated cancer have survived for three years and still fewer have survived for five years. Most of the cases, however, were rather hopeless in the beginning. The best results were obtained when suitable pre-operative as well as

postoperative treatment was given, but even following such measures there were many recurrences. Several cases in which the results were unusually successful are reported in detail.

ADOLPH HARTUNG, M.D.

Beck, E. G.: Denudation of Inoperable Cancer, an Aid for Efficient Radiotherapy. *Minnesota Med.*, 1921, iv, 360.

Radiotherapy after denudation was tried in about 50 apparently hopeless cases. The results demonstrated that at least certain cases of this type may be benefited in this manner and possibly cured. The skin and other tissues overlying deep-seated malignant neoplasms absorb many of the rays which ought to reach the growth if it is to be eradicated. Hence the removal of these tissues materially facilitates the application of effective radiation. Use may then be made of softer rays which will be absorbed by the tumor cells and exert a more deleterious effect upon them than more penetrating rays which would be necessary otherwise. When radium capsules are embedded in the growth, the rays radiating in all directions are utilized instead of merely those radiating in one direction.

The author cites a number of cases in detail in which the method described was used. Many of these, however, are of too recent date to warrant conclusions. He intends publishing a statistical report in about two years. Thus far the results have been encouraging.

ADOLPH HARTUNG, M.D.

Pfahler, G. E.: The Clinical Results from the Newer Technique of Deep Roentgenotherapy in Malignant Disease. *Am. J. Roentgenol.*, 1921, n.s. viii, 236.

Following reports that better results were being obtained in Germany in the roentgen treatment of deep-seated malignant diseases by the use of a greater amount of filtration, longer skin focal distances, and higher voltages, the author endeavored to change his technique to approximate these factors as well as possible with the apparatus available in this country. Instead of using 5 milliamperes of current at 126,000 volts at a focal skin distance of 20 cm. filtered through 6 mm. of aluminum for a period of eight minutes, he now employs 5 milliamperes at 126,000 volts, filtered through 10 mm. of aluminum or glass at a focal skin distance of 30 cm. for a period of forty to fifty minutes. He found that an erythema was rarely caused in forty minutes but usually resulted in fifty minutes.

This technique has been developed gradually, in part by calculation and in part by experimentation. With its use it is undesirable from every standpoint to limit the field of radiation to small areas as has been done in the past. It is always best to cross-fire as much as possible. Mere division of the surface of the body into small areas, as is often done, however, does not increase the cross-fire value.

Using the newer technique, Pfahler has obtained some very brilliant results not equalled by his former technique. He believes that it is desirable in all instances to give the malignant focus as much treatment within the first month or two as can be borne by the healthy tissues as in this way it is destroyed while it is still more sensitive to radiation than normal tissue. The best safeguard against an increase in the radiation sickness which is induced by the longer exposures was found to be the lengthening of the intervals between the treatments or doses.

The author summarizes his conclusions regarding the new technique as follows:

1. Increased filtration, with increased focal skin distance, will increase the value of deep radiation as compared to the surface effect.

2. By increasing the two factors mentioned the time of radiation is greatly increased — probably five-fold. This prolonged radiation in itself may be an important factor in preventing cell division and regeneration of the cancer cells.

3. As radiation sickness is increased extra effort must be made to overcome this effect.

4. The greatest caution must be observed to keep the filters in place and at their full prescribed quantity.

5. Increased protection is necessary for both the patient and the operator.

6. The clinical results obtained from this new deeper technique excel those obtained formerly.

ADOLPH HARTUNG, M.D.

Sante, L. R.: Conclusions Drawn from the Consideration of 80 Cases of Pneumoperitoneum.
J. Radiol., 1921, ii, 9.

Pneumoperitoneum should be used, not to supplant other established methods of examination, but as an additional aid when the latter have failed to give the desired information or their use would be of no avail. It cannot be employed in lieu of a barium-meal examination for lesions of the gastrointestinal tract, and it will not render tumor masses of the pyloric end of the stomach visible. It should not be used to obtain a plate of the kidneys unless the kidney outline cannot be made out and a urinary stone or other kidney condition is suggested by a definite shadow. It may be necessary for the differentiation of shadows suggesting urinary stones when the ureters cannot be catheterized. It should not be employed for the demonstration of gallstones until a conscientious effort has been made to demonstrate them in the usual manner. If an examination has revealed nothing and a pathologic condition of the gall-bladder is suspected or if the usual method of examination has disclosed a suspicious shadow, pneumoperitoneum is justified to localize the shadow to the gall-bladder area. Although the risk involved in the procedure and the discomfort to the patient are slight, these conditions do obtain and the promiscuous use of the method is not to be advocated.

Indications for the use of pneumoperitoneum are fairly definite. The author divides the cases in which he has found it of value into six groups: (1) those in which information was desired concerning the presence, position, size, form, and mobility of the intra-abdominal organs, (2) those in which there were masses of undetermined origin, (3) cases of kidney or ureter involvement in which other methods did not yield the desired information, (4) cases of gall-bladder conditions in which the ordinary methods of examination failed, (5) cases in which there were postoperative or other adhesions to the abdominal wall or other viscera, and (6) cases of subdiaphragmatic conditions in which it was desired to determine whether the lesion was above or below the diaphragm, or whether this region was involved at all.

Sante presents a brief description of the technique used. He describes by word and illustration the picture presented by normal and pathologic conditions and cites a few illustrative cases.

The contra-indications to pneumoperitoneum are: (1) cardiac lesions with marked decompensation and irregularity, (2) advanced cases of nephritis with oedema and very high blood pressure, (3) acute intra-abdominal lesions, and (4) acute pulmonary lesions, such as pneumonia.

ADOLPH HARTUNG, M.D.

Failla, G.: The Absorption of Radium Radiations by Tissues. *Am. J. Roentgenol.*, 1921, n.s. viii, 215.

This investigation was undertaken to determine the absorption by different tissues of the radiations of radium filtered through various thicknesses of metal. The scope of the work was to apply the knowledge thus obtained to radium therapy. The paper is summarized by the author as follows:

The apparatus used, consisting of a gold-leaf electroscope and conical ionization chamber, and the experimental procedure are described in detail.

The most important limitations imposed by the experimental method adopted are discussed. They are due to: (1) the use of a metal ionization chamber, (2) the use of a gas as the absorbing medium in the ionization chamber, (3) exclusion of scattered and secondary radiation produced in tissue, and (4) inability to reproduce physiological conditions in the physical laboratory.

The absorption curves for aluminum, brass, and lead are given. From these it is seen that: (1) as the filter increases the transition from soft to hard radiation is sharp; (2) beyond a thickness of filter of a few millimeters in the case of aluminum and brass the absorption is exponential while in the case of lead it is not exponential in the range of thickness used; (3) filtration by a small thickness of metal is sufficient to give a radiation which is absorbed exponentially by metals of medium or low atomic weight, this radiation, however, being not strictly homogeneous, as indicated by the lead absorption curve.

As the criterion for the quality of radiation to be used in deep therapy is the exponential absorp-

tion of the radiation by tissue, it is evident that: (1) a metal should be used as the primary filter, (2) a secondary filter, composed of light elements like tissue, should be used to remove the soft secondary radiation of the metal, (3) there are different combinations of primary and secondary filters suitable for deep therapy, and (4) beyond a certain point, additional filtration, while increasing the penetrating power of the radiation slightly, decreases the intensity of the radiation considerably.

In deep therapy the limiting factor is the effect on the skin. Therefore it is important to know what fraction of the skin radiation reaches a given depth of tissue. The value of this fraction can be varied within limits by varying the distance of the applicator from the skin or the filtration.

An example is worked out to show that in the case of gamma rays it is more economical to increase the percentage of the skin radiation which reaches a deep tumor by increasing the distance of the applicator than by increasing the filtration.

A second example shows that when two sources of radiation of distinctly different penetrating power are used, the same percentage of a skin dose at a certain depth of tissue can be obtained in either case by choosing the distance of application properly.

A table shows that when the distance of the applicator is great in comparison to the tumor depth, the penetrating power of the radiation has the greater influence on the tumor dose, but when the distance of application is about the same as the tumor depth and the radiation is very penetrating, the distance has the greater influence on the tumor dose.

It is shown also that when the distances are adjusted so as to obtain the same skin dose and the same dose at a depth of 3 cm., radiation of different degrees of hardness being used, the doses are not the same at any other tissue depth, and especially at greater depths than the one for which the doses are the same.

The coefficient of absorption is the important factor which identifies radiation. The numerical value depends on the quality of the radiation and the nature of the absorber.

When the same tissue is used as an absorber and the filtration of radium rays is varied in steps from 0.48 mm. of brass to 3 mm. of lead, the coefficient of absorption gradually decreases from 0.0765 to 0.0709. But while the penetrating power of the radiation is increased 7.3 per cent by the additional filtration, the available radiation is decreased 65 per cent.

The same radiation (1.92 mm. brass filter) is absorbed to a different extent by different tissues. For soft tissues the coefficient of absorption is proportional to the density of the tissue.

The absorption of tissue of different organs (except lung tissue, fat, and solid bone) is nearly the same. Therefore if 0.075 is taken for the value of the coefficient of absorption of gamma radiation filtered through 1.92 mm. of brass, one is sure to

be on the safe side in any calculation for practical use. Corresponding to this value of the absorption coefficient, the thickness of tissue necessary to absorb one-half of the radiation is $0\frac{1}{4}$ cm. As a round figure easy to remember, the half value thickness of human muscle tissue for gamma rays may be regarded as 10 cm.

The presence of bone in the path of the radiation is of no great consequence in regard to the amount of gamma radiation which reaches the tumor beyond it. The only part of the bone which absorbs considerably more than muscle is the solid part. In any practical case, however, this makes up a small fraction of the total thickness traversed by the radiation. In the case of the X-rays bone plays a more important part.

The results obtained from the experiments described in this article can be used for the solution of problems in radium therapy subject to the following limitations:

1. The calculated amount of radiation reaching any given tissue depth is always the minimum amount which will reach this depth under the conditions of radiation.

2. Skin doses of beta and gamma radiation are not to be compared according to the ionization values given in the accompanying figures. They must be determined independently by physiological experiments.

ADOLPH HARTUNG, M.D.

INDUSTRIAL SURGERY

Deal, D.: Subsequent Treatment in Casualty Cases. *Illinois M. J.*, 1921, xxxix, 413.

This is a brief article dealing with the various means of administering physical therapy, massage, electrotherapy, and hydrotherapy in accident cases. The author urges the adoption of these well-tried measures in order that this group of patients may be saved from quacks and charlatans. In his opinion the surgeon requires the services of a well-trained physical therapist equally as much as those of a radiologist.

Practically every casualty condition, except infection and malignancy, will improve under scientific physiotherapy employed to overcome shortening of the fibro-elastic elements in tendons, soften and free adherent scars, and relieve pain and swelling. By hastening repair we shorten disability.

Massage is of value, especially in the treatment of splinted limbs, to maintain the tone of the muscles, to prevent ankylosis, and to shorten the time for union.

Diathermy is of great benefit in the treatment of swelling and pain incident to fracture and sprain. It penetrates deeply and produces extensive and lasting hyperemia which relieves congestion and promotes healing.

Negative galvanism attracts hydrogen and may be used to overcome cicatricial contractions.

The slow sinusoidal current is of greatest value when employed with active muscular exercise.

The faradic current is employed to limit degeneration and relieve pain. The static current is of value in cases of neuritis and sprain.

Hydrotherapy is used in the after-care of emergency cases because of its stimulating effect, especially when hot and cold water are used alternately.

Heat may be conductive or radiant; the latter is more effective and less dangerous.

J. J. LEBOWITZ, M.D.

Mock, H. E.: Reconstructive Surgery. *Minnesota Med.*, 1921, iv, 343.

Statistics compiled by the Department of Labor in 1917 show that annually 875,000 men and women are disabled for more than four weeks, 76,000 persons suffer loss of members, at least 200,000 are otherwise permanently disabled, and 28,000 persons are killed in industrial accidents.

The author defines the various terms used in reconstructive surgery. Physical reconstruction comprehends continued and complete medical and surgical treatment until the maximum physical and mental restoration of the disabled person has been secured. Various adjuncts to physical reconstruction include functional re-education, occupational therapy, physiotherapy, and rehabilitation.

Functional re-education consists of various methods to restore function in a disabled part, to train other members to new work, or to teach persons who have been subjected to an amputation the use of artificial appliances.

Occupational therapy is the use of some form of work to activate certain muscles or disabled members of the body for their functional restoration, or to keep the patient's mind and body occupied during the long period of the convalescence.

Physiotherapy includes the use of massage, hydro-, electro-, and mechano-therapy, muscle training exercises, gymnastics, and calisthenics to restore function or build up the patient's general condition.

Rehabilitation, or the refitting of the disabled man for an independent economic position in society, consists of non-medical and non-surgical measures including vocational training and the replacement of the handicapped at lucrative employment.

The author states that many industries practice a false form of economy by employing cheap under-trained surgeons. In Pennsylvania the gross total of workmen's compensation awarded and paid for fatal accidents and those causing disability amounted to \$16,917,000.00 during two and one-half years. Figures from other states indicate that considerably more than \$100,000,000 annually is disbursed in payment of accident compensation claims throughout the United States.

In Chicago there is an organization known as the "Service League for the Handicapped" which gives practical assistance to the work of rehabilitating those physically handicapped by disease as well as by accident. This organization has an executive committee of fifteen influential men, representing

business, medicine, education, and safety engineering. Its board of management is composed of delegates from almost every agency in the city dealing with some phase of the problem of the handicapped. Although only one year old, this organization has accomplished the rehabilitation of 260 permanently handicapped persons, many of whom were absolutely dependent upon relatives, friends, or the Associated Charities.

The author presents thirteen very interesting illustrative cases. **FREDERICK CHRISTOPHER, M.D.**

Mehl, W.: What Constitutes a Fair Estimate of the Loss of the Use of an Eye in Workmen's Compensation Cases? *Med. Rec.*, 1921, xcix, 826.

The author calls attention to the present lack of agreement on the part of ophthalmologists as to what should be considered the standard for fixing the percentage of loss of vision sustained by an injured eye in workmen's compensation cases. A man who is told in New York that the efficiency of his injured eye has been reduced one-half, learns in Illinois that the loss was only 11 per cent, and in Wisconsin that he suffered an impairment of only 6 per cent. In the State of New York the law makes one hundred and twenty-eight weeks of compensation the maximum payable for the loss of an eye. The legislature of 1920 added two important amendments, to wit: "The loss of 80 per cent of the vision of the eye shall be considered to be the equivalent of the loss of the use of the eye, and the loss of binocular vision shall be considered to be equivalent to the loss of one eye."

In Mehl's opinion the safest standard for determining a percentage of vision is supplied by the Snellen test. By this test 20/40 means 50 per cent loss of vision, 20/60 means a 66⅔ per cent loss, 20/80 means a 75 per cent loss, etc. In addition to being simple, this test is just. Accidents causing loss of field (peripheral) vision alone are so extremely rare that the average injury to the eye should not be minimized by the thought that perhaps the field (peripheral) vision has sustained a less serious loss than the central vision. As regards binocular vision, the author holds that it is affected in some measure by every impairment of central vision.

FREDERICK CHRISTOPHER, M.D.

LEGAL MEDICINE

Parks, A. H.: The Medicolegal Expert. *J. Lancet*, 1921, n.s. xli, 292.

The medical man is called upon as an expert witness for the purpose of enlightening the court and jury upon those subjects in which he is supposed to be an authority because of special study and practical experience, and by virtue of authority granted him by the State to practice the general subject of medicine and surgery. The expert medical witness is a necessity, and it devolves upon the medical profession to supply the need for such witnesses. To

those who are professionally and temperamentally qualified as experts and are willing to make a study of this branch of work, there is an opportunity also to earn remunerative fees.

The ideal medical expert is one who has established for himself a personal and professional reputation for integrity and has a wide range of general knowledge in the field of medicine and surgery in addition to that gained from special study and preparation in his particular branch or specialty. He is able to express himself clearly in simple language which can be understood by the layman and to speak loudly enough and to enunciate clearly enough so that everyone interested in the case is able to hear his testimony without confusion. His temperament is cool and judicial, for the ability to keep his temper under often trying circumstances is essential. He is a clear thinker and able to say enough without confusing the issue. Above all, he is not ashamed to say, "I do not know," — an answer, incidentally, that would keep many an expert out of deep water. An ability to see ahead and anticipate in his own mind the point toward which counsel is wandering by devious routes has helped many men to arrive at final conclusions in an orderly fashion.

The present method of selecting experts used by attorneys of the plaintiff and defendant could be greatly improved by leaving such selection to the court. A joint examination of all hospital records, X-ray plates, and laboratory data at hand, with a free and frank expression of opinions, would go far toward establishing a fairly uniform diagnosis and prognosis.

The subjective symptoms often lead to a wide variation of opinion, depending upon the expert's belief in the truthfulness of the statements of the patient. An honest difference of opinion in open court occasionally can be well understood and tolerated, and no special harm is done except to the feelings of the experts themselves; in such a circumstance the court and jury usually put no weight whatever on the expert testimony offered.

As human nature is the same in the members of the medical profession as in all others, it is difficult to retain a judicial mind when dealing with cases of injury or illness. The attorney and patient are usually certain to make out for their case all there is in it without always giving due regard to the facts. The defendant, on the other hand, is just as certain to minimize the findings unfavorable to his cause. To the expert falls the duty of determining the exact point of truth between these diverging views. It is, therefore, most essential to approach the problem from the very beginning with an unbiased mind. This attitude is best attained by not associating as an expert too long with either the plaintiff or the defendant side of litigation.

An order of the court appointing disinterested experts, together with an order producing all medical records bearing on the case for the guidance of the experts in the formation of an opinion, would be

an ideal toward which members of the medical profession might well strive. An expert witness is not in any sense an advocate, and any tendency to so appear goes further to discredit his views with both court and jury than any other position he might take. The one and only duty of the expert is to present his views on a technical subject to the best of his ability so that the court and jury may so understand the subject in hand that they may reach a definite and proper conclusion.

Any attending physician or surgeon may be called into court by subpoena if the subject of his services comes into court for the adjustment of his alleged claim, but such attendance in court, which is involuntary, need not call for the qualification of the witness as an expert. He may be questioned as to the facts of his attendance, his diagnosis, treatment, and prognosis, but that is as far as he need answer unless he wishes to qualify as an expert. Any and all questions, including hypothetical questions, which call for conclusions of the witness beyond the facts stated are subjects for the expert, and as such need not be answered under subpoena. The appearance of the expert is voluntary and should call for proper remuneration.

As a rule medical men attempt to impress the jury, and perhaps also the court, by an extensive use of technical medical words which have no meaning whatever to the ordinary layman. If the medical man on the witness stand would use ordinary English in expressing himself his testimony would have far greater weight. A medical man in testifying should be emphatic and, if possible, positive.

The engaging of a physician or surgeon as an expert and the payment of large fees often make the expert an advocate instead of an unbiased witness.

Expert testimony has been a subject of controversy with the courts for a long time. Measures to place it on a better basis would constitute a welcome reform.

When a lawyer may engage a physician or surgeon, interest him in the cause, and pay him large fees for his testimony, the latter becomes, if he has any weaknesses at all, an advocate. It would be better to have the experts selected by the judge. Otherwise a limit should be placed upon the fees which they may receive. This limit should be placed very low in order that there may be no temptation for the sale of expert testimony or the purchase of advocacy on the part of the expert witness.

In giving opinions too many medical witnesses are controversial, and as soon as a fair-minded jury comes to the conclusion that a witness is taking sides it begins to discount his statements. The system is questionable to say the least. When a party brings in his expert witness just as he brings in his lawyer, the opinion of the former is not on a very different plane from the opinion of the latter which usually counts for nothing. The author expresses the hope that eventually some plan will be worked out whereby experts will be called in by the court and paid out of public funds. J. A. CASTAGNINO.

The Relation Between Physicians and Roentgenologists. *Runyan et al. vs. Goodrum (Ark.), Feb. 21, 1921.*

The Supreme Court of Arkansas not only reversed a judgment for \$25,000 damages rendered in favor of the plaintiff, Goodrum, for roentgen-ray injuries, but also dismissed the case. It was alleged that the defendants were partners in the general practice of medicine and surgery and that they owned and operated a hospital which had a roentgen-ray department under the supervision of a roentgenologist, a physician, who was assisted by a Miss Green who, he said, was as competent as he was although she was not a physician.

The plaintiff was a patient in the defendants' hospital and was seriously burned in the operation of the roentgen-ray machine by Miss Green. This gave rise to the important question whether, in an action by a patient against physicians and surgeons to recover damages for their alleged malpractice caused by the alleged negligence of a roentgenologist whom they had employed to assist them, such a specialist stands in the same relation to the physicians who employed him as if he had been another physician employed to give the patient the necessary attention in their absence.

No case was cited, and the court itself found none, which decided that exact question. The court concluded, however, that as the science of roentgenology is so interrelated with the sciences of medicine and surgery in the diagnosis and treatment of human diseases, it should be classed in the same category with those sciences, and the roentgenologist should be placed in the same class with the physician and surgeon because of the peculiar knowledge and technique he must possess and because in the practice of his profession such knowledge and technique are dedicated almost exclusively to the aid of the physician and surgeon in the diagnosis and treatment of diseases of the human body. Furthermore, the roentgenologist, like the physician and surgeon, unless he expressly contracts to produce certain results, has the right to, and must at all times, act according to his independent judgment and discretion in the exercise of his skill and learning in the treatment of human diseases. The character of his contract of employment involves this right.

Such being the case, it follows that the relation of master and servant cannot exist between physicians and surgeons who are not roentgen-ray specialists themselves and the roentgen-ray specialist or roentgenologist whom they employ to assist them in the diagnosis and treatment of diseases. The fact that the roentgen-ray specialist for whose alleged negligence recovery of damages was sought was working at the defendants' hospital in the X-ray department equipped by the defendants for such work did not affect the character of employment between the defendants and Miss Green so far as the performance of her work was concerned.

The next questions raised were whether the screen used by Miss Green for making fluoroscopic ex-

aminations of the plaintiff was defective; if so, whether the defendants were negligent in failing to exercise ordinary care to furnish a perfect screen; and whether such negligence, if any, was the proximate cause of the injury. The principles of law applicable to the facts of the case are well established. As the defendants maintained a roentgen-ray department at the hospital it was their duty to exercise ordinary care to see that this department was equipped with such apparatus as was generally approved by roentgenologists for the proper diagnosis and treatment of diseases, and to exercise care to provide competent specialists to do the work in that department.

Ordinary care for the successful management of such an institution means a very high degree of care because it has to do with the lives and health of human beings. The roentgen-ray machine of the highest type and manipulated by a competent expert is of inestimable value to mankind, but otherwise it is an exceedingly dangerous agency. The duty of the defendants to exercise ordinary care to employ competent roentgenologists and to provide safe apparatus for their roentgen-ray department could not be delegated to another. If, therefore, there was in use in the defendants' roentgen-ray department a defective screen which the defendants or their chief roentgenologist knew to be defective, or by the exercise of ordinary care should have known to be defective, and if the use of such a defective screen was the proximate cause of the injury to the plaintiff, the defendants were liable to the plaintiff in damages.

The chief roentgenologist, so far as the duty of furnishing the necessary apparatus was concerned, was the agent of the defendants and his knowledge was their knowledge. For this purpose he was at all times under the immediate control of the defendants and could not exercise his independent judgment and discretion. In this instance he manifestly did not regard the screen as unsafe or dangerous even though it might cause additional exposures.

The doctrine of *res ipsa loquitur*, or the matter speaks for itself, does not apply in such cases because the testimony showed that on account of the idiosyncrasies of the roentgen-ray machine one person of a certain type and temperament would be susceptible to a burn while another person of a different type and under the same circumstances would not be burned. Moreover, it was shown that burns occur occasionally in the ordinary course of the exposure in spite of the highest diligence and skill to prevent them.

J. A. CASTAGNINO.

Fund Owned by Hospital Held Not Subject to Income Tax. *Ledere vs. Stockton C.C.A., 266 Fed., R., p. 676.*

A testator bequeathed his residuary estate to the Pennsylvania Hospital, subject to payments to certain annuitants. All of the annuitants died except one. The trustee holding the fund invested

it in a loan to the hospital. In a suit to recover income taxes, alleged to have been illegally collected, it was held that on payment of sufficient interest to cover the administration charges and the annuity to the sole surviving annuitant, the income of the fund was not subject to tax under an act of October 3, 1913, nor under an act of September 8, 1916, both of which by appropriate provisions declare a purpose to exempt from tax the income of any "corporation or association organized and operated exclusively for . . . charitable . . . purposes."

J. A. CASTAGNINO.

Rules as to Number of Patients and Number of Visits—Endarteritis Obliterans. *Sinclair vs. Brunson et al. (Mich.), 180 N.W.R., p. 358.*

Because of soreness of the toe following the removal of a corn the plaintiff in this case consulted the defendants, father and son, who were country physicians. After treating the toe they were obliged to amputate it.

The plaintiff contended that proper care was not given the toe, and that as a result thereof infection set in, making it necessary ultimately to amputate the leg just below the hip.

The defendants denied all neglect and asserted that the plaintiff was suffering from endarteritis obliterans for which there is no cure, and that the amputation of the leg was the inevitable result of the disease regardless of the treatment given, and that therefore they were in no way responsible for the loss of the plaintiff's leg.

There was testimony to support each of these conflicting contentions. Medical experts who testified on each side did not agree regarding the case or the effect of endarteritis obliterans. One of them testified that if the disease was present at all it would affect all the arteries. On the other side it was claimed that it might plug some of the arteries without affecting others. The charge to the jury was as follows:

"In determining whether or not the doctors visited the plaintiff as often as they should have visited him, you are to take into consideration the community in which the parties lived and the territory which the doctors had to cover, and the number of patients whom they had to visit. Their skill, or lack of skill, and their conduct in giving treatment and in making visits is all to be determined by you in view of the situation as it appeared to them at the time and the circumstances surrounding them and surrounding their patient.

"It is not the law that physicians may accept so many patients that they are therefore excused if they neglect some of them and harm results from that neglect. The trial court went as far as it should when it said in its charge substantially that, in considering the testimony relative to the visits made by the physicians, the physicians alone were the judges of the number of visits which should be made and the time they should be made provided they used the ordinary judgment of physicians practicing

in the community where they practiced or in similar localities, and there could be no damages for failure of the defendants to call as often as the plaintiff thought they should, provided the defendants used the judgment that was ordinarily used by physicians in the community where they practiced or in similar communities."

After a physician had testified that he had treated twenty-five or thirty cases of endarteritis obliterans which demanded special attention and that the number of his patients who did not require special treatment ran into the hundreds, another physician was asked how he accounted for this large epidemic of the disease which the first physician had found in Chicago. The first physician then answered that he did not know, but thought that he was confused and talking about something entirely different—arteriosclerosis. The Supreme Court concluded that the admission of the testimony was a harmful error. It was not for the witness to draw conclusions in relation to the other physician, but for the jury. Nor could reference to the number of cases of the disease reported in the Murphy Clinics be sustained as furnishing proper statistics, when there was no foundation showing how the Murphy Clinics came into existence or what field they covered.

A new trial was ordered.

J. A. CASTAGNINO.

Period of Temporary Total Incapacity—Unreasonable Refusal to Submit to Operation. *Mount Olive Coal Co. vs. Industrial Commission (Ill.), 129 N.E.R., p. 103. O. W. Rosenthal & Co. vs. Industrial Commission et al. (Ill.) 129, N.E.R., p. 176.*

The Supreme Court of Illinois stated, in the first case, that under the Workmen's Compensation Act the period of temporary total incapacity is that temporary period immediately following the accident during which the injured employee is totally incapacitated for work by reason of the illness attending the injury, i.e., the period of the healing process. The employee in this case suffered what was described as a greenstick fracture of the radius of his right arm about $1\frac{1}{2}$ in. above the wrist. The period of temporary total incapacity was that period during which he was unable to work because of the broken bone in his arm. When the bone had completely knitted and the usual attendant soreness and stiffness had disappeared the period of temporary incapacity ended, the disability then present being necessarily due to the permanent character of the injury received. If the employee had lost his hand, the period of temporary disability would have been his physical state until the stump was healed and he was able to get about. The loss of the hand would have been the permanent disability for which compensation is allowed under another division of the Workmen's Compensation Act.

The evidence in this case showed, without dispute, that there was solid union of the bone, and all that ailed the employee was adhesions in the tendons of the wrist and hand which could be overcome by a simple operation which is attended by no danger

whatever and is painless if a mild and entirely safe anæsthetic is used. The permanent disability of the employee was due to his refusal to submit to this simple operation rather than to the accident. The court stated that if the operation were performed and proved unsuccessful the employer would be liable for whatever loss of use of the hand remained as well as for the surgical and hospital services necessary for the operation and the treatment already received; but if it was successful, his liability would be for the temporary loss of time, for treatments received, and for surgical and hospital expenses incurred.

In the second case the Supreme Court of Illinois stated that the sole question before it was whether the industrial commission properly suspended compensation on the employee's refusal to submit to a surgical operation such as was requested for the cure of a hernia due to an injury. The testimony of the physicians was to the effect that the operation is a comparatively slight procedure. While the hernia was caused by the accident, it appeared from testimony that an injury of this kind does not, like many wounds, become cured in the ordinary process of healing. On the facts as found in the record the court concluded that the findings of the commission suspending the award were justified. The courts are bound by the commission's finding

J. A. CASTAGNINO.

Questions in Malpractice Case—What the Law Implies. *Osnos vs. Scanlon (Iowa), 179 N. W. R., p. 869.*

The Supreme Court of Iowa, in reversing a judgment for \$500 damages which was rendered in favor of the plaintiff for alleged malpractice in the treatment of a fracture above the ankle, stated that the plaintiff did not contend that the defendant lacked the requisite skill and learning, but claimed that he failed to exercise the proper degree of skill.

At the trial the defendant was asked whether or not in his treatment of the plaintiff he gave him the benefit of his judgment and best skill. An objection to the question was sustained on the ground that it involved matter for the jury to decide; that the witness could tell what he did and let the jury judge whether that was best. This was followed by the question as to whether, in his treatment of the plaintiff, the defendant had at all times given him his best attention. An objection to this question also was sustained.

The fact that the court sustained the objection meant to the jury, in effect, that it should not be considered. The Supreme Court cannot assent to the proposition that the exclusion of the evidence is non-prejudicial. The very essence of the charge against the defendant was, in effect, that he did not use the proper degree of skill; that he did not exercise the degree of skill possessed by him; that he did not use his best judgment.

In the absence of a special contract the law implies that a surgeon employed to treat an injury contracts

with his patient, first, that he possesses the reasonable degree of learning and skill which is ordinarily possessed by others of the profession; second, that he will use reasonable and ordinary care and diligence in the exercise of skill and the application of his knowledge to accomplish the purpose for which he is employed; and, third, that he will use his best judgment in the application of his skill in deciding on the nature of the injury and the best mode of treatment.

The defendant was asked whether he used his best judgment. No one else could testify as well as he whether he did or not. Of course, if he said he did, it would not necessarily be binding on the jury but the jury was entitled to the evidence.

The plaintiff claimed that the splints and cast were so loosely put on as to allow the foot to lie over on the bed and move at the site of fracture. Assuming this to be true, a medical witness testified that the effect on the foot would be very painful. He was then asked whether the patient could endure such pain without a sedative and without the loss of weight. The Supreme Court concluded that the question was objectionable, but that possibly the defendant could have elicited the information sought by framing the question somewhat differently, asking for instance, how severe the pain would be, and whether the effect of it would be to cause a loss of weight, etc. However, the court stated that it was not suggesting the form of the question and that perhaps it would not reverse the judgment which the plaintiff obtained on the ground alone of the objectionableness of the question as asked.

J. A. CASTAGNINO.

Company Held Liable for Malpractice of Physician.

McMahon vs. Carolina Spruce Co. (N. C.), 105 S. E. R., p. 439.

The Supreme Court of North Carolina found no error in a judgment in favor of the plaintiff on a verdict which included a finding that he was entitled to recover \$4,000 damages for the malpractice of a physician employed by the defendant to treat him when he was injured while working for the defendant. The court stated that there could be no question but that there was some evidence which tended to establish the charge of unskillfulness in the method of treatment and failure to exercise proper care and to make a proper diagnosis. There was undoubtedly sufficient evidence also that the defendant knew of the incompetence of the physician.

The particular allegation was that the physician, who was assisted by another physician, failed to place the bones of the plaintiff's arm in proper alignment as he left them overlapping and without union between them, thus shortening the arm about 2 in. and leaving it very crooked and ugly in appearance and practically useless. The physician was employed and paid to treat employees with money obtained on the assessment plan from the wages of the employees. The court stated that the

defendant owed the duty to the plaintiff, after it had undertaken to secure treatment for him, to secure a physician of reasonable skill and ability. The evidence of a prior suit to which the defendant was a party, and in which it was informed of the physician's lack of skill, was sufficient to charge it with notice of the same on the question of negligence.

J. A. CASTAGNINO.

Misrepresentations as to Health and Consultations in Application for Insurance. *Chadwick vs. Beneficial Life Ins. Co., Utah Supreme Court, 191 Pac., R., p. 240.*

In an action on a life policy the defense was that the insured had represented himself in his application to be in good health whereas he was at the time suffering from the disease from which he died, and that he had made material misrepresentations as to consultations with physicians. Prior to his application he had suffered from some malady causing him pain in the back and had consulted doctors without obtaining relief. After his death an autopsy showed that he died of tuberculosis of the spine.

The physician who conducted the medical examination on the application testified that the usual

physical examination was given the applicant, and that in this examination it was not apparent that the applicant was suffering with tuberculosis of the spine. He testified also that if the applicant had answered truthfully the questions put to him in the medical examination information would have been given which would have suggested such a condition. He recommended the applicant for insurance without reservation. He testified that he would not have made this recommendation if the applicant had stated that he had consulted a physician some time previously with regard to pain in the back which became more intense and severe after hard labor, and that he would have used such information in the medical examination as a basis for discovering the ailment for which the applicant had been under treatment. Three other physicians testified that the applicant must have known, or had reason to believe, that he was suffering from a disease of a serious nature even if he did not know what it was.

Judgment was reversed and a new trial ordered as the trial courts refused to direct a verdict for the insurance company on the ground that the policy was rendered void by false statements.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Garland, G. M.: *A Mechanical Explanation of the Suffering Which Is Associated with Prolapse of the Uterus.* *Boston M. & S. J.*, 1921, clxxxiv, 689.

Mechanical obstruction to the escape of the venous blood from the uterus and the congestion produced thereby are detrimental to the health and function of the organ.

The author never makes any attempt to change or disturb the condition of flexion which may be present. In his cases the uterus is elevated in the knee-chest position with as little force as possible, dependence being placed largely on gravitation, and is then supported with a small pessary.

The relief of subjective discomfort is always coincident with the restoration of circulation as indicated by the behavior of the organs themselves. The process of cure is coincident also with the diminution of congestive enlargement, retraction of the relaxed adnexa of the uterus, and the increase in the ability of the uterus to retain its normal position and its normal circulation. E. L. CORNELL, M.D.

Gemmell, J. E., and Robinson, A. L.: *The Operation of Ventrofixation, with the After-Results of 220 Cases.* *Lancet*, 1921, cc, 1291.

The operation of ventrofixation, in which widely different methods have been used, has come into disfavor because of postoperative complications such as obstetrical difficulties, abortions, intestinal strangulation, etc. Such sequelæ condemn the type of operation, but do not prove that its principle is fundamentally unsound. A properly performed operation of this kind does not interfere with subsequent pregnancy or labor and in a large proportion of cases effects a permanent cure of the symptoms for which the operation was done.

The authors' conclusions are based on data concerning 220 patients. All of these patients were operated on before December, 1917, by one type of operation. In 115 cases the operation was done for retroversion, and in the remainder as a part of the treatment of prolapse.

Ventrofixation is indicated in cases of marked prolapse in young fertile women. For women past the menopause an abdominal operation is often undesirable and unnecessary since vaginal methods will produce a permanent cure. The operation is done through a 2 or 3 in. vertical incision or the transverse Pfannenstiel incision. The latter gives a sound and invisible scar and is recommended if infection is absent. The uterus and adnexa are examined for the purpose of determining their position and the presence and nature of co-existent lesions. The peritoneum covering the bladder is

picked up in the midline with a series of forceps arranged as guides from the utero-vesical attachment to the upper border of the symphysis pubis. The latter point coincides with the parietal peritoneum at the lower angle of the incision. A running catgut suture beginning at the utero-vesical fold is inserted into the peritoneum and extended downward, upward, and forward over the bladder and up to the parietal peritoneum to bunch the peritoneum and form a median septum stretching across the utero-vesical pouch between the uterus and the abdominal wall. The ends of the suture are then brought through the rectus fascia on each side just above the symphysis pubis. This method prevents the formation of adventitious bands and peritoneal fossæ and eliminates the danger of postoperative strangulation of the bowel. At a point on the uterus just above the utero-vesical ligament the fixation is effected by two silk worm-gut sutures passed through the uterine muscle and the rectus fascia just above the insertion of the running suture at the symphysis.

The results were investigated by two methods: the objective method, that is, examination by the surgeon, and the subjective method, that is, a questionnaire. Questionnaires were sent to all patients and physical examinations were made when possible. The following conclusions were reached:

1. Ventrofixation is a simple and useful operation for certain types of uterine displacement.

2. Postoperative intestinal complications do not occur and subsequent gestation and parturition are not interfered with if a suitable technique is followed.

3. The frequency of abortion is diminished and fertility is increased.

4. The percentage of patients subjectively cured is satisfactory. Subsequent occurrence of symptoms after operation is due largely to factors beyond the control of the surgeon, such as labor, over-exertion, recurrence of infection, the menopause, and neuroses.

MERLE R. HOON, M.D.

Chueco, A.: *A Comparison Between Laparotomy and Colpotomy in a Case of Hydatid Cyst of the Posterior Wall of the Uterus of a Virgin* (Paralelo entre la laparotomía y la colpotomía en una observación de quiste hidatídico de localización uterina intramural posterior en una mujer virgen). *Semana méd.*, 1921, xxviii, 481.

Chueco states that when an operation is performed by the vaginal route for a suppurative process rupture will not be followed by grave consequences as this route is normally the habitat of bacteria. The vaginal flora need be feared only when the intervention is for a non-infectious process. In

such cases precautions for antisepsis must be redoubled. When an operation for a suppurative adnexal lesion is performed by the abdominal route the opposite holds true; rupture will occur into a sterile region, the surgeon works from the non-infected skin and parietal peritoneum toward an infected medium, the pyosalpinx.

Chueco gives the clinical history of a case of hydatid cyst in a girl 15 years of age. The cyst was diagnosed but its location was not definitely determined. A median laparotomy was done. The cyst was found but the uterus formed an integral part of it and the cervix compressed the bladder against the posterior wall of the pubis. As the cyst could not be brought to the surface, the author determined to puncture it through the anterior wall of the uterus. However, because of the great tension of the fluid, the liquid contents of the cyst did not flow through the needle but escaped by the side of the puncture into the uterine cavity and the latter soon became dilated.

The abdominal incision was therefore closed and a posterior colpotomy was done. This gave access to the cyst, which was then evacuated, and the cystic membrane was withdrawn in its entirety. The vaginal operation consumed only a few minutes. The facility with which the tumor was removed causes Chueco to repeat his precept that the caliber of the vagina ought not to be taken into account when it is a question of extirpating tumors of the female internal organs whatever their situation, size, or contents, provided they are reducible and can be brought to the surface. In the case reported the lower wall of the large cystic tumor rested upon the sacral concavity and its superior pole was higher than the pubis and in contact with the abdominal wall.

W. A. BRENNAN.

Strong, L. W.: Adenomyometritis, Not Adenomyoma of the Uterus. *Am. J. Obst. & Gynec.*, 1921, 1, 901.

It appears to be a universal custom to designate all macroscopically visible gland and muscle new-growths as adenomyomata whether they are present as diffuse thickenings of the uterine wall or in localized globular form. The term "adenomyometritis," when rarely used, is reserved for the appearances revealed by the microscope. The term "adenomyoma" denotes a neoplasm and it is of very practical importance to know when, if ever, that designation is justified as neoplasms are capable of unlimited growth while hyperplasia may regress if the exciting cause is removed. Furthermore, the biological significance of the two terms is entirely different. This applies also to adenomyomata occurring in other situations, such as the umbilicus and round ligament.

Such tumors, which are very common in the uterus, are seen either as circumscribed, myomatous growths containing glands or as diffuse thickenings of the myometrium in which the mucosa is in the form of moist and soft circular depressions.

Both the discrete globular forms and the diffuse thickenings of the uterine wall are universally termed "adenomyomata." Of these, the diffuse form is by far the most common. The diffuseness of growth is so characteristic that enucleation is impossible even in the forms which are more or less sharply localized in one area only. This fact in itself speaks against a neoplasm. The diffuse tumors may grow to a considerable size and may be found in the cervix as well as the corpus.

There is no criterion in histology which will differentiate hyperplasia from neoplasia in its inception. Both represent reactions of the tissue to underlying stimuli, and the reaction is the same as far as the histology is concerned. The criterion which is taken as definitive of neoplasia is destructive growth, but even this is unreliable to a certain extent as granulation tissue of inflammation may be in excess of the needs of repair and destroy normal tissue.

E. L. CORNELL, M.D.

Deaver, J. B.: Cancer of the Uterus. *Am. J. M. Sc.*, 1921, clxi, 661.

Deaver's conclusions are based on a study of 500 hysterectomies performed by him at the Lankenau Hospital since 1916. While admitting that radium therapy is challenging surgery in the treatment of uterine cancer, he is inclined to the view expressed by an English colleague as follows: "When the pen has superseded the sword the scalpel will still be needed for myoma."

Early diagnosis is essential. While it is not always possible, microscopic study of curettings and sections of the uterus and cervix at the first suggested clinical signs will avail much. Even if only one malignant case were found in a hundred such examinations the procedure would be justified. Pain is a late rather than an early symptom of uterine cancer.

Deaver overcomes the limitations of curettage by hysterotomy and a careful search of the line of demarcation between the endometrium and the muscle layer. When the former irregularly invades the latter, he does a complete hysterectomy. If the pathologist is in doubt, radical removal is the rule. Because of the frequency of cervical cancer, complete rather than supravaginal hysterectomy is done on patients near or at the menopause.

When malignancy is limited to the uterus surgery is probably as successful as any other method. Deaver is not as much impressed with radiation treatment as radiologists. He states that too many radium "cures" have proved to be only regressions. No inconsiderable percentage of failures from either surgical or radium treatment may be traced directly to improper technique. The most disastrous results may follow the improper use of radium.

A histologic study by Reimann of uteri removed from one to six weeks after radiation showed living cancer cells outside the necrotic area in a case of cervical cancer and in a case of carcinoma of the fundus.

In conclusion the author states that in certain selected cases, especially those of inoperable uterine cancers, radium has a field of usefulness.

W. H. CARY, M.D.

Proust and Mallet: The Abdominal Route for the Insertion of Radium in the Treatment of Uterine Cancer (Contribution à la technique de la pose du radium par voie abdominale dans le cancer de l'utérus). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 872.

Recently, in a case of inoperable cancer, Schwartz introduced emanation needles of radium into the abdomen through a laparotomy incision. Proust and Mallet use radium tubes holding about 2 mg. of radium element which are protected by a filter. In a recent case of inoperable cancer the steps taken by them were as follows:

The abdomen was opened and the right hypogastric artery ligated. This ligation effected a certain degree of hæmostasis in the broad ligament and served as a landmark from which a soft instrument was passed to the base of the broad ligament. Two rubber tubes each containing in its extremity a small tube of 2 mg. of radium bromide were placed in the right hypogastric sheath. The peritoneum was then closed around the rubber tubes and the same procedure repeated on the left side.

The uterus was then turned back with a forceps so as to expose the anterior surfaces of the broad ligaments and the peritoneum was incised a little below the round ligament and at 2 cm. outside the border of the uterus to expose the posterior surface of the bladder and the lateral parts of the vesico-uterine cul-de-sac. Three tubes of radium having been placed in this area, the peritoneal opening was closed with a pursestring suture. The same manoeuvre was then repeated on the left side.

The rubber tubes were led out through the lower part of the abdominal incision, and the incision was sutured. The tubes were withdrawn at the end of four days. The postoperative course was uneventful.

The effects of this method of applying radium in inoperable uterine cancer can be known only later. Schwartz has reported good results. The authors state that the correct placing of radium is a surgical procedure requiring exact technique.

W. A. BRENNAN.

Hartmann, H.: The Technique of Perineal Hysterectomy for Cancer of the Neck of the Uterus (Technique de l'hystérectomie périméale pour cancer du col de l'utérus). *Gynec. et obst.*, 1921, iii, 350.

Hartmann describes the technique of perineal hysterectomy as practiced by Cunéo and Picot. This differs considerably from the paravaginal hysterectomy of Schuchardt-Schauta, but resembles, at least in the skin incision, the hysterectomy preceded by transverse perineotomy which Zuckerkandl described in 1889. Cunéo and Picot regard this

operation as particularly suitable for obese women. In such cases the surgeon works with difficulty where there is much fatty tissue and the patient does not support anaesthesia well in the raised pelvis position. The perineum, however, varies only slightly from the normal and a perineal hysterectomy can be executed with as much facility as in the case of a moderately thin woman.

Cunéo and Picot use spinal anaesthesia. The patient is placed in the inverse perineal position and a slightly convex transverse incision is made about 2 cm. behind the fourchette from one ischium to the other. The two ischio-rectal fossæ are then opened, the anus is pushed back, the fourchette is pulled forward with the forceps, the rectovaginal muscle is sectioned, and the vagina is separated from the rectum to the Douglas sac and as far laterally as possible. The posterior wall of the vagina is incised on the median line to the point where it is desired to make the transverse incision of the vagina. When this transverse incision has been made the vagina is liberated for about 2 cm. above the section and then separated from the neck of the bladder as far as the vesico-uterine cul-de-sac. The latter is then opened, the bladder is raised with a traction forceps, and the systematic ligation of the vaginal and other arterial pedicles is effected with care to avoid injuring the urethra. Section of the two vaginal pedicles following their ligation brings the region of the uterus to view. The uterine artery, uterosacral ligaments, and the round ligaments are then sectioned and the adnexa are removed. The hysterectomy is completed by suturing the peritoneum and reconstructing the vagina.

W. A. BRENNAN.

ADNEXAL AND PERI-UTERINE CONDITIONS

Hawks, E. M.: The Ovary After Hysterectomy for Fibroids. *Am. J. Obst. & Gynec.*, 1921, i, 959.

This study is based on a series of 84 cases from the service of Pool of the New York Hospital. The operations were performed in the years 1915 to 1919 inclusive. The examinations in the follow-up clinic were made by the members of the visiting staff.

Of 91 patients, 84 returned for examination. All were examined at least once, and most of them several times. When this summary was made 50 had been followed one year, 26 for two years, 14 for three years, 10 for four years, and 6 for five years.

The author's observations indicate that it is better to leave healthy ovaries and tubes after hysterectomy for fibroids done before and near the time of the menopause. This conclusion is based on the following facts:

1. The onset of the vasomotor disturbance was delayed when one ovary was left and further delayed when both were left. The severity of the symptoms was diminished when one ovary was left and almost eliminated when both were left.

2. Very little serious harm was caused by a retained ovary. One patient in 65 was referred for

secondary operation on account of a cyst. Twelve in 65 complained of pain or had a swelling at the site of a retained ovary but in 11 of the 12 the trouble disappeared after about three months.

3. There was more trouble when the tube was removed than when it was left with the ovary.

E. L. CORNELL, M. D.

Jaegerroos, B. H.: Hydrosalpinx, Its Pathological Anatomy, Etiology, Pathogenesis, and Clinical Aspects (Die Hydrosalpinx, ihre pathologische Anatomie, Aetiologie, Pathogenese und Klinik). *Arch. f. Gynaek.*, 1921, cxiv, 328.

A considerable portion of this article is devoted to the pathological anatomy of hydrosalpinx. The dilatation of the tube, caused by a more or less large collection of a thin, watery, or slightly blood-tinged fluid following closure of the abdominal end of the tube by chronic salpingitis, involves only a portion of the entire length of the tube. The tube is twisted on its long axis. The dimensions of a hydrosalpinx appear never to exceed those of a child's head.

The histologic picture of hydrosalpinx is not uniform; as a rule, however, the mucosa is more or less thickened, the epithelium retained, and the musculature normal or showing intermingled connective tissue. The blood-vessel walls are thickened and even in the widely dilated sacs the vascularization is slight.

In the etiology only bacteria come into consideration: the gonococcus, the tubercle bacillus, and streptococci. A localized peritonitis develops from a salpingitis and results in closure of the ostium of the tube. The author denies the inflammatory character of the hydrosalpinx fluid. He regards it in most cases as a transudate into a cavity in which an inflammatory process has regressed.

As in the majority of cases the cysts are situated in the small pelvis, their growth is limited by the bony ring. It is limited also by peritonic adhesions.

Clinically it is noticed that the process develops slowly unless torsion of the hydrosalpinx sac

occurs. The disease cannot always be diagnosed with certainty even by bimanual examination.

While the prognosis is usually favorable, in a considerable number of cases the condition has such painful consequences that relief is to be obtained only by operation.

Puncture of the sac is useless as the fluid always collects again. An incision through the vagina may be beneficial because of atrophy of the walls. The operation of choice is radical removal, which should be done by means of a laparotomy rather than by the vaginal route because of the presence of adhesions. If possible, only the diseased tissue should be removed. The uterus and ovaries should be preserved in order to avoid the disturbances of an artificial menopause.

KNOKE (Z).

MISCELLANEOUS

Fothergill, W. E.: The End-Results of Vaginal Operation for Genital Prolapse. *Med. Press*, 1921, n. s. cxi, 471.

Genital prolapse includes cystocele, rectocele, prolapse of the uterus, protrusion of an elongated cervix from the vagina, and any combination of these. In the cases reviewed the operations were anterior colporrhaphy, amputation of the cervix, posterior colporrhaphy, and perineorrhaphy. The first two were done in one operation whenever amputation was necessary, and the other two constituted a colpo-perineorrhaphy when rectocele was present.

Of the 156 patients traced 150 reported that they were cured and 2 others were found to be cured on examination. The cures therefore amounted to 97½ per cent. Twenty-seven of the patients were between 20 and 30 years of age; 59, between 30 and 40; 41, between 40 and 50; 19, between 50 and 60; and 3 over 60. About one-third had passed the menopause. Twenty-four women had had 30 labors and 2 were pregnant. Of the 24 women delivered only 1 required an operation. Of the 26 women who became pregnant 23 had had cervical amputations in the combined operation.

R. E. CHRISTIE, M.D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Gibson, H. K.: *The Sequelæ and Later Aspect of the Toxic Albuminurias of Pregnancy.* *Surg., Gynec. & Obst.*, 1921, xxxii, 513.

The 30 cases presented comprised 15 cases of eclampsia, 3 cases of abruptio placentæ, and 12 cases of albuminuria with varying degrees of hypertension. In tabular form are given the syndrome upon the patient's admission to the hospital, her condition upon discharge with special reference to the renal findings and arterial tension, the results of subsequent pregnancy, and her status præsens. Three patients died of renal and cardiorenal affections, one, five, and eight years postpartum respectively. Seven of those who had eclampsia or a pre-eclamptic condition show today a well-marked clinical nephritis with hypertension, and two have an arterial tension suggestively high.

The author believes that normal arterial tension and freedom from renal symptoms following toxic albuminuria in one pregnancy is no proof that these conditions will not recur in a subsequent pregnancy, and that irreparable damage to the kidney, heart, and vessels is a much more frequent sequela of the eclamptic and pre-eclamptic toxæmias than is generally supposed.

Among the patients whose cases are reported, seven who manifested albuminuria and hypertension of varying severity had subsequent pregnancies. While cases without a recurrence are not infrequent, the author believes that the selection of cases in which subsequent pregnancies should be allowed requires extreme discrimination with consideration of the three outstanding hazards, i. e., irreparable damage to the heart and kidneys, prematurity, and eclampsia.

Ray, H. M.: *Primary Ovarian and Primary Abdominal Pregnancy—Their Morphological Possibility; Report of a Case of Each.* *Surg., Gynec. & Obst.*, 1921, xxxii, 437.

Although the possibility of primary ovarian pregnancy is now universally admitted, there are still a number of critics who have not abandoned their skepticism. Up to the present time there have been reported at least 20 authentic cases in which the ovarian origin was conclusively demonstrated by careful microscopic study. In 1899 Van Tussenbroek published a careful histologic description of an early case in which she demonstrated beyond question that the ovum could be embedded in the ovary. Three years later Thompson demonstrated a perfectly conclusive specimen.

In Ray's opinion the factors upon which ovarian pregnancy depends are fertilization and retention of

the ovum within the graafian follicle or its immediate neighborhood until such time as it becomes capable of embedding itself by its own activities, when it may do so in any patch of connective tissue sufficiently vascular to meet the demands of its nutrition. The following case of ovarian pregnancy is reported:

The patient was admitted to Bellevue Hospital June 26, 1918, with the complaint that three days before her admission she was suddenly seized with an intense and sharp pain in the lower abdomen which caused her to faint. A similar attack occurred one night before admission. There was no discharge of blood or other material from the vagina. Her family and previous history was negative.

Physical examination revealed a systolic murmur at the apex and some tenderness over both iliac fossæ, particularly the left. There was no rigidity. Bimanual examination under ether revealed a large, soft, boggy mass on the left side.

Laparotomy showed the uterus to be normal in size and displaced to the right; the right tube and ovary were normal; the left tube was slightly oedematous but otherwise completely intact; milking brought no fluid from the fimbriated extremity. The ovary had been replaced by a large, globular, hæmorrhagic mass enclosed in a thin capsule which, being broken in several places, allowed the protrusion of blood clots. The abdominal cavity was distended with fluid and clotted blood. Sections from the hæmorrhagic mass revealed everywhere numerous chorionic villi embedded in the stroma of the ovary. There were a number of scattered giant masses corresponding to syncytium and large islands of swollen, richly chromatic cells identical with the cells of the trophoblast. Nothing resembling a true decidua as it occurs in the uterus was seen.

The author reports also the following case of abdominal pregnancy:

The patient was admitted to the hospital with the history that on the night previous she was suddenly seized with severe cramp-like pains in the lower abdomen. These continued to increase and the following morning caused her to faint. Her family and previous history was negative. Her menstrual history also was negative except for slight dysmenorrhœa. At the time of her admission to the hospital there was a bloody vaginal discharge which the patient said was her usual menstrual period.

The physical examination showed the patient to be a young white female acutely ill and extremely pale. The abdomen was distended and tense and showed a fluid wave. There was generalized abdominal tenderness with the maximum point of tenderness in the midline just above the symphysis.

Examination under ether showed the uterus in front and a soft boggy mass in each fornix. Dilatation and curettage brought forth a small amount of apparently normal endometrium.

At laparotomy it was found that the peritoneal cavity was distended with fluid and clotted blood. The uterus and adnexa were delivered and both tubes and ovaries found to be absolutely normal. On the anterior wall of the uterus, just above the level of the internal os and slightly to the right of the midline, was a pea-sized ragged area, oozing blood from its center. An attempt to pass a sharp probe through the center into the uterus met with no success. The small pathologic lesion was regarded as a new growth and excised. The gap was closed with interrupted sutures and the raw surface covered with a fold of bladder peritoneum. The patient made an uneventful recovery.

The specimen subjected to pathologic examination was 12 mm. long and 7 mm. wide. It consisted for the most part of a rather firm, yellowish-gray tissue which showed on the peritoneal surface an area of hæmorrhagic infiltration extending downward to a depth of 3.5 mm. Near the peritoneum the muscle fibers were loose and the vessels engorged and showing dense perivascular round-cell infiltrations. Nearer the periphery there were irregular areas of hæmorrhage throughout which were numerous collections of polynuclear leucocytes and small round cells. At the extreme periphery and actually implanted in the myometrium were numerous typical, well-preserved chorionic villi. Adjacent to the villi were several groups of large, richly chromatic trophoblastic cells. C. H. DAVIS, M.D.

Geist, S. H.: The Diagnosis and Treatment of Chorio-Epithelioma. *Surg., Gynec. & Obst.*, 1921, xxxii, 427.

Chorio-epithelioma represents a truly parasitic growth as it originates from cells foreign to its host and then maintains an independent existence, drawing its nutrition from the tissue in which it is embedded.

The division of malignant chorio-epitheliomata into two groups, typical and atypical, though seemingly arbitrary, has been well maintained ever since it was first made by Marchand. In the class designated as typical the histologic picture is distinct. One finds multinuclear syncytial masses and also groups and plaques of mononuclear Langhans cells showing mitoses and variations in size, shape, and state of degeneration. As the extent of participation of both components varies markedly, any one of the elements may predominate and there are all possible gradations. While the growth is exceedingly vascular, it shows a marked tendency to disintegrate and become necrotic. This type is considered to be the malignant form.

The second group, those of the atypical form, show invasion of the musculature of the uterus by syncytial masses or isolated cells and are characterized by the absence of Langhans cells. Metastases are

more commonly associated with the typical chorio-epithelioma and may be formed not only in the pelvis and vagina but in all the organs of the body, especially the lungs. These metastases are developed through the blood stream. One of the characteristics of the tumor is a tendency to erode blood vessels and to grow into their lumina, a tendency which favors metastasis. On the other hand, while the atypical group give rise to metastases, they are comparatively uncommon and rarely if ever so widespread.

The author next discusses Ewing's classification at some length, reports 14 cases which he has had the opportunity to study, and summarizes his article as follows:

1. There are two groups of tumors arising from the chorionic epithelium and included under the term chorio-epithelioma: (1) typical chorio-epithelioma, better termed "choriocarcinoma"; (2) the atypical chorio-epithelioma, better termed "syncytioma."

2. There are numerous transition stages between these two groups.

3. A class which are really not tumors, but represent an exaggerated reaction to pregnancy has been designated as "atypical chorio-epitheliomata." For this class the term "syncytial hyperplasia" is suggested.

4. The diagnosis from curetted or expelled material is extremely difficult except in the clear-cut cases of the two groups.

5. In the transitional types a prognosis deduced from the histologic structure is doubtful.

6. An indication for operation is established by a positive diagnosis of choriocarcinoma.

7. Delay is indicated by a positive diagnosis of syncytioma.

8. In cases of syncytioma hysterectomy is indicated only by the clinical course.

9. In transitional cases hysterectomy is indicated.

10. Abdominal hysterectomy is the operation of choice.

11. In cases of choriocarcinoma abdominal hysterectomy, if done early, gives a fair prognosis.

12. In cases of syncytioma abdominal hysterectomy gives an excellent prognosis.

C. H. DAVIS, M.D.

Gellhorn, G.: The Influence of Syphilis upon the Pregnant Woman. *Surg., Gynec. & Obst.*, 1921, xxxii, 535.

In the past, discussions on syphilis in pregnancy have been limited almost entirely to the harm which may befall the unborn child. Most of the textbooks on obstetrics also convey the impression that the mother has nothing to fear from the disease. While this is true in a very large percentage of cases, the author finds from personal observations and a review of the available literature that syphilis may be the cause of complications in the mother by impairing her general health during pregnancy and

the puerperium and by obstructing the birth passage or causing other more or less serious damage in labor.

As both the mother and the child are endangered, therefore, the possibility of syphilis must ever be borne in mind, particularly when pregnancy is associated with disturbances of obscure origin. When the diagnosis is made, energetic and systematic treatment must be given throughout the period of pregnancy.

The author reviews twenty-eight cases collected from the literature and his own experience.

C. H. DAVIS, M.D.

LABOR AND ITS COMPLICATIONS

Frankl, O.: Normal Separation of the Placenta.

Surg., Gynec. & Obst., 1921, xxxii, 450.

Up to the present time our knowledge concerning premature separation of the placenta has been faulty because of erroneous conceptions regarding the physiological separation of the secundines. After discussing the various theories Frankl gives his views as to the factor which, during the third stage of labor, cause separation of the placenta. He states that this separation is effected within the decidua spongiosa. Until the rupture of the decidua spongiosa neither contraction nor diminution of the area of adhesion plays any active rôle in placental separation or the production of the retroplacental hæmatoma. Therefore muscular contraction and diminution of the area of insertion of the placenta are the result rather than the cause of the separation. Several microphotographs which appear to substantiate this theory are shown.

The separation of the membranes is effected by traction exerted by the placenta and occurs either within the trabecular portion of the spongiosa or, more frequently, within an area of certain loose fibers lying between the compacta of the parietal decidua and the decidua reflexa.

H. B. MATHEWS, M.D.

Planell, D. A.: The Choice Between Pubiotomy and Cæsarean Section (Conducta para elegir entre la pubiotomía y la cesárea). *Arch. de ginec., obst. y pediat.*, 1921, xxxiv, 115.

Pubiotomy is indicated when the true conjugate or bi-ischial diameters are from 3 to $2\frac{1}{2}$ cm. too narrow to allow the passage of the measured fetal diameters. The operation is not considered contra-indicated in primiparæ any more than in women who are older (up to 40 years of age). Pubiotomy is immediately followed by extraction of the fetus according to the mechanism of parturition. If the head is well flexed and engaged in the superior strait, the forceps are applied; otherwise version is practiced and the labor terminated by the Mauriceau manoeuvre.

Pubiotomy is chosen when possible in preference to cæsarean section because in uninfected cases it is less dangerous than the opening of the peritoneal

cavity, and in infected cases it is less dangerous than the extraperitoneal route. Contact of the uterine fluids with the open lymphatics about the peritoneal cavity is more to be feared than their contact with the raw tissues left after pubiotomy. Moreover, pubiotomy will leave the pelvis permanently enlarged so that future labors will be facilitated.

Cæsarean section is indicated when there is a disproportion of more than 3 to $3\frac{1}{2}$ cm. in the pelvic diameters and in cases of obstruction due to osseous tumors, cicatrices, or faulty development of the soft parts. Even in uninfected cases the extraperitoneal section is preferred to the classical section because in the former there is no danger of adhesions to the uterine scar and the scar in the lower uterine segment is of minimal extent.

JOHN W. BRENNAN, M.D.

Williams, J. W.: A Critical Analysis of Twenty-One Years' Experience with Cæsarean Section.

Bull. Johns Hopkins Hosp., 1921, xxxii, 173.

The author reports the results of 183 operations on 145 women which were performed in approximately 20,000 deliveries. Nearly one-half of the women were colored. One hundred and fourteen sections were done on colored women and only 69 on white women. Fifty-seven colored women and 14 white women had repeated sections. One hundred and twenty-one of the operations were typical conservative cæsarean sections, 4 were extraperitoneal, 1 was done postmortem, and 57 were supravaginal amputations or Porro cæsarean sections.

There were 10 deaths, a mortality of 5.45 per cent. Two were due to cardiac failure, 1 to chronic nephritis, and 1 to acute anæmia from gastric and intestinal hæmorrhages. These occurred on the fortieth, eighth, eighth, and twenty-sixth day, respectively, following the operation. The operative mortality was 3.35 per cent. Three of these deaths were due to unavoidable causes, 3 to errors in judgment, 5 to general peritonitis following conservative operation, and 1 to failure to control hæmorrhage during a Porro section. Five deaths occurred in the first 49 operations and 1 in the last 130 (10 and 0.77 per cent, respectively). The more favorable later results were due to earlier operation, better sewing of the uterine wound, and non-evisceration of the uterus except in infected cases when the Porro operation was done.

The wisdom of early operation was shown by the examination of 14 uteri amputated late in labor. In 2 of these cases the signs of intrapartum infection were noted, and in 12 the temperature and pulse were normal. In every instance microscopic study demonstrated ascending infection. Another factor favoring early operation was the clinical course of the puerperium in the cases treated conservatively. The puerperium was normal or afebrile in 54.4 per cent of the cases when operation was performed before the onset of labor and in only 14.2 per cent when it was done after twenty-four hours.

Following Porro operations the puerperium was normal more frequently. After the conservative section the incidence of stitch and wound infection increased from 8 to 25 per cent with the duration of labor, but following the Porro section there was little variation except in frankly infected cases.

The indications for cæsarean section are given in the following table:

Pelvic Indications			
Types of pelvis:	Total	White	Colored
Generally contracted rhachitic.....	86	3	83
Simple flat.....	15	15	
Flat rhachitic.....	13	6	7
Scolio-rhachitic.....	8	1	7
Kypho-scolio-rhachitic.....	1		1
Generally contracted.....	6	4	2
Funnel.....	6	5	1
Achondroplastic.....	4	4	
Kyphotic funnel.....	2	1	1
Coxalgic.....	1		1
Hypoplastic dwarf.....	1	1	
Oblique (luxation).....	1	1	
	144	41	103
Other Indications			
Condition:	Total	White	Colored
Eclampsia.....	9	5	4
Heart.....	8	6	2
Atresia of cervix.....	4	4	
Ovarian cysts.....	3	3	
Neglected transverse presentation..	3	3	
Premature separation of placenta....	2	1	1
Nephritic toxæmia.....	2	2	
Myoma.....	1		1
Ventral fixation.....	1	1	
Pregnancy in rudimentary horn.....	1		1
Placenta prævia.....	1	1	
Hour-glass contraction.....	1		1
Excessive size of child.....	1	1	
Carcinoma of cervix.....	1	1	
	39	28	11

When the pelvis is normal, cæsarean section is indicated in the treatment of eclampsia only when the cervix is rigid and undilated and the patient has failed to show improvement after venesection. The 3 neglected cases of transverse presentation were those of multiparæ who had had several normal spontaneous labors in which the child was delivered in good condition. In this labor, however, the arms protruded from the vagina, the patient had been examined by midwives and ignorant physicians, and the uterus was in tetanic contraction. In each case a Porro section was done.

For cases of placenta prævia the author believes the best treatment is the use of the rubber bag and that cæsarean section is indicated only when the cervix is rigid and undilated and bleeding is very profuse.

Porro section was done 57 times, in 36 cases as a primary procedure and in 21 as a second or third section. The indications were: sterilization in

17 cases, delay in second stage of labor or manifest intrapartum infection in 13, heart disease in 5, atresia of the cervix in 4, transverse presentation in 3, uncontrollable hæmorrhage in 2, and other causes in 1 case each. Sterilization was done because pregnancy following repeated cæsarean sections is undesirable, because the patient requested it, or because it was indicated by the patient's social or mental condition.

Seven per cent of the babies were deeply asphyxiated but more than one-half cried at once. Most of them were males but there was no relationship between the situation of the corpus luteum as regards the right or left ovary and the sex incidence.

The best technique for cæsarean section demands small incisions in the abdomen and incision of the uterus *in situ*.

In 2 of 5 cases the placenta was on the anterior wall but interfered only with the first gush of blood.

R. E. CHRISTIE, M.D.

PUERPERIUM AND ITS COMPLICATIONS

Bartram, G.: Treatment of Puerperal Fever with Human Serum (Ueber die Behandlung des Puerperalfiebers mit menschlichem Serum). *Zentralbl. f. Gynaek.*, 1921, xlv, 529.

The author reports the results of treatment of puerperal fever with human serum in 1912 in the Tuebingen Clinic. The serum was obtained by centrifugalization. From 15 to 50 c.cm. were injected intravenously. As a rule one injection was given daily. It was obtained from patients who had had a puerperal fever, from convalescents, from healthy women, or from the patients themselves. Three particularly severe cases were cured in this way.

The effect may be due to passive immunization or to the action of protein bodies (Bingel's horse serum treatment of diphtheria or the milk or casein treatment by Schmidt and Lindig's method).

The author has treated several cases successfully with caseosa but in others there were unpleasant anaphylactic phenomena. The latter were not noted when autoserum was used. Apparently the normal serum of pregnant women has a greater effect than that of non-pregnant women.

VORSCHUETZ (Z).

Lumentut, H. F.: Extirpation of the Uterus in Puerperal Sepsis (Gebaermutterextirpation bei puerperaler Sepsis). *Nederl. Tijdschr. v. Geneesk.*, 1921, lxx, 1843.

In 1886 Schulze of Jena first extirpated the uterus because of puerperal sepsis. This operation was afterward performed in different countries but was everywhere given up except in France. Recently the Freiburg Gynecological Clinic has reported good results in puerperal sepsis from the administration of proteins. Others have used all possible types of sera and vaccines.

The recent English and German literature has been more concerned with bactericidal measures

than with operation. In recent American literature, however, operative measures in puerperal pyæmia, including ligation and excision of infected veins, have been given considerable attention. The French school also has taken up operative treatment recently.

In January, 1920, a case of septic abortion was reported in which hysterectomy was successful. Faure prefers the vaginal method. The good results reported in France stimulated the author to try the procedure in suitable cases. It is well known that septic abortion often ends in spontaneous recovery. About 10 per cent of the most severe cases, however, reach the clinic. Several cases of septic abortion with chills and symptoms of pyæmia are described. Hysterectomy was life saving. Laparotomy was performed in every instance because it gives a better view of the field of operation and permits inspection of the adnexa and the establishment of drainage on both sides.

Regarding the indications for operation Faure says the uterus should be removed if, twenty-four hours after curettage, there is no marked improvement, that is, if the temperature does not fall, the pulse remains high, and chills persist. In Lumentut's opinion it is a mistake to curette when the temperature is high. He believes that if operation

can be performed in acute appendicitis and other inflammatory processes in the abdominal cavity, there is no reason why it cannot be done when the uterus is the source of infection. It is a question of the life of the mother and the most radical methods are permissible. KOCH (Z).

NEW-BORN

Burnell, M.: A Case of Intra-Uterine Fractures.
J. Michigan State M. Soc., 1921, xx, 243

Burnell reports the delivery in a case of a sacrum right anterior presentation. The child weighed 3,044 gm. and measured 48½ cm. in length. The cephalic diameters were normal. Routine examination revealed the fact that many of the long bones were curved and their shafts were nodular. Under the slight manipulation the right femur was broken. The family history was negative.

The condition was believed to be osteogenesis imperfecta, chondrodystrophy, congenital syphilis, or congenital rickets, most probably the first. The roentgenologist reported as follows: "All of the bones show a marked increased radiability denoting loss in lime-salt content." The presence of new bone formation indicated old or intra-uterine fractures. The prognosis is grave. R. E. CHRISTIE, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Boyd, M. L.: Nephritis and General Surgery.

South. M. J., 1921, xiv, 368.

Boyd summarizes the facts regarding nephritis which should be known by the surgeon and the methods he should employ as follows:

1. He should recognize the presence of a nephritis and determine the extent of impairment of kidney function.

2. If possible, he should learn the cause of the nephritis and relieve it before operation.

3. He should take suitable measures to prevent an exacerbation of the nephritis and further injury to the kidneys which might result from an operation.

4. Except in cases of necessity he should not operate when the kidney impairment is so great that it is improbable that the patient will live very long under any circumstances.

Recognition of the presence of a nephritis is fairly certain if an early morning specimen of urine is examined for albumin and casts. The more acute the attack of nephritis the greater the concentration of the albumin. However, neither from the quantity of albumin nor from the quantity and character of the casts can much information be obtained concerning the extent of permanent functional impairment, and it is usually with the latter that the surgeon is most concerned.

The presence of pus is of itself a warning that the kidney function must be determined before non-emergency surgical procedures of any kind are undertaken.

Of the many methods used to test the functioning of the kidneys there are at least two which are very simple and satisfactory: (1) the determination of the quantity and concentration of seven specimens of urine collected during a period of twenty-four hours, and (2) the phenosulphonephthalein test.

The cause of many cases of chronic nephritis and of some acute cases cannot be learned. Syphilis may produce all degrees of nephritis without other apparent symptoms of the disease. A seemingly normal tonsil may be the cause of well-marked changes, and there are various other responsible conditions which may be overlooked if they are not carefully sought.

Unless the kidney function is very low the immediate danger of operation in chronic nephritis is that the impairment in function may become greater as the result of the strain incident to the operation.

The routine of preparation for operation adopted by nearly all surgeons to-day includes the prin-

cipal measures used in caring for the kidneys. Certain features, however, require emphasis:

1. From a few days to several weeks should be allowed for the preparation of the patient for operation if nephritis is present.

2. The bowels should be kept open. Water should be given freely and the patient should take moderate daily exercise.

3. When the kidneys are badly impaired the anæsthetic should be nitrous oxide and oxygen, its effectiveness being increased when necessary by small amounts of ether.

4. The blood pressure should be watched and heart stimulants should be administered in time to be of value.

5. Hypodermoclysis of 500 to 800 c.cm. of normal saline solution is of great value. Intravenous injections of 250 c.cm. of normal saline with 10 minims of adrenalin chloride solution are well borne if given slowly and may be repeated in three to six hours if necessary. The indication for their use is based on the amount of fluid the patient is absorbing and eliminating. Proctoclysis is undoubtedly beneficial but is inferior to the more direct hypodermoclysis and intravenous injections. It gives the best results when an open No. 30 French rectal tube is used and the water container is hung just above the level of the rectum.

4. Acute nephritis is a contra-indication to operation unless it is caused by the condition for which the operation is to be performed.

THEODORE DROZDOWITZ, M.D.

Pousson: My Experience in the Surgery of Nephritis (*Ma pratique de la chirurgie des néphrites*). *J. d'urolog. méd. et chir.*, 1921, xi, 353.

Since 1898 Pousson has been an advocate of the surgical treatment of medical nephritis not only in the acute crises and the complications of chronic nephritis but to repair the effects of the inflammatory processes. In this article he reports the results of his operations in this field.

The twenty-nine cases reviewed include all varieties of nephritis, both acute and chronic, and cases in which all medical methods were tried without avail.

Seven cases of acute nephritis were operated upon with only one operative death. Five nephrotomies and two nephrectomies were done. The one death followed a nephrectomy. This patient was in a very alarming condition at the time of operation and Pousson believes a nephrotomy might have saved his life. One patient died from infection of the other kidney four months after operation, and one died of infection generalized throughout the urinary tract four and one-half years after operation.

In Pousson's opinion incision of the renal parenchyma gives the best results. This procedure fulfills the three fundamental indications, relief of congestion, antiseptis, and drainage.

In eleven cases of chronic nephritis with complications menacing life the following operations were done: one simple unilateral decapsulation; two simple bilateral decapsulations; two unilateral decapsulations combined with nephrotomy; eight unilateral nephrotomies and drainage of the renal pelvis; and one nephrectomy. There were six deaths, three within a few hours after operation and three between the fifth and seventh days afterward. Although the mortality was nearly 50 per cent, it must be borne in mind that the condition of the patients was very serious, and this, rather than the operation, Pousson believes, was probably responsible for the fatal outcome.

Of the five patients who survived operation two died about two years subsequently, two are still alive, and one cannot be traced. The amelioration in these cases may be attributed chiefly to the operation.

Of the six immediate deaths, one followed bilateral decapsulation; one, decapsulation and nephrotomy on the same kidney; one, decapsulation of one kidney and nephrotomy on the other; and three, unilateral nephrotomy. In all cases there was marked oedema with uræmia or oliguria.

Pousson reiterates his preference for nephrotomy as compared with nephrectomy and decapsulation. Nephrectomy is rarely indicated. Decapsulation attacks only one of the factors of an acute crisis, viz., compression of the renal parenchyma, but nephrotomy (which may be associated with decapsulation) is efficacious in remedying intrarenal tension and acts rapidly as well on uræmia, oedema, and hypertrophy of the heart.

A nephrotomy was done in four cases of chronic painful nephritis. These were cases, if not of Bright's disease, at least of inflammatory lesions resulting from irritation of the anatomical elements by uric or oxalic salts. A rapid and permanent recovery was obtained in every instance.

In four cases of chronic hæmaturic nephritis two nephrectomies and two nephrotomies were done. All of the patients recovered.

In hæmaturic nephritis the lesion is almost always unilateral. Therefore nephrectomy removes the cause. As the causes of the hæmorrhage lie in anatomical alterations of the vessels in general, vascular hypertension, hypertrophy of the heart, and disturbances of the innervation of the anatomical elements of the kidney, the benefit of nephrotomy is due to relief of the congestion and blood pressure and decompression of the strangulated nerve elements.

Three patients operated upon in the course of chronic nephritis to overcome oedema and improve the function of the kidney made good recoveries, but one died seven months later from a cardiac condition.

W. A. BRENNAN.

Bugbee, H. G.: Primary Carcinoma of the Kidney with Impacted Ureteral Calculus. *J. Urol.*, 1921, v, 267.

Because of the confusion which has persisted so long with regard to the differential diagnosis of tumors of the kidney, particularly true malignant disease and hypernephroma, and because of the fact that the origin of these neoplasms is still under dispute, the author believes it is of importance to report additional cases.

In an effort to elucidate the origin of hypernephroma, the so-called "Grawitz tumor" of the kidney, he quotes Dunn and reviews briefly the theories of other writers. He states that epithelial abnormalities of the three types, namely, suprarenal rests, adenopapillary tissue, and papilliferous cysts, were found fairly frequently in the kidneys in a series of 80 consecutive cases. In Bugbee's opinion any of these aberrant epithelial structures might conceivably give rise to malignant tumor formation, but of the three the papilliferous cysts seem to be the most probable origin of tumors of the Grawitz type because of their peculiar histologic structure.

While hypernephroma may be regarded as of frequent occurrence, true malignant neoplasms of the kidney are generally conceded to be relatively rare. From the statistics of autopsy and operating rooms Garceau compiled a table of all tumors affecting the urinary tract found at the Massachusetts General Hospital during a period of ten years. These included 33 hypernephromata of large size and distinctly malignant type, 3 carcinomata, 2 sarcomata, and 4 malignant papillary adenomata. He holds that carcinoma of the pure type is a tumor of extreme rarity in the kidney, and insists, on the basis of his investigations, that the tumor most commonly found in the kidney is that derived from adrenal rests, namely, hypernephroma.

In a study of the clinical records of 83 malignant tumors of the kidney operated on at the Mayo Clinic up to July 1, 1912, Braasch classified these tumors according to their histologic structures as hypernephroma (mesothelioma), sarcoma, carcinoma, and embryoma, but pointed out that a clinical differentiation according to this histologic classification is usually impossible prior to exploration. From a clinical point of view, therefore, he considered the various forms of tumor together. Complete data of malignant renal tumor (a palpable tumor in the region of the kidney, hæmorrhagic urine, persistent pain referred to the region of the tumor, and the general symptoms of malignancy) were found in but 32 of the 83 cases studied. Two of the three symptoms were present in 37 cases, and but one in 14 cases. He considers it evident, therefore, that the clinical diagnosis must often be based on only one or two cardinal symptoms.

Bugbee reports the case of a man 44 years of age. The patient's family history was negative. In 1892 he had a sharp attack of left renal colic, but did not pass a calculus. About fifteen years ago he had another attack. In October, 1918, a severe attack of

influenza was followed in two weeks by hæmaturia and pain and tenderness in the left upper quadrant and the lumbar region on the left side.

Examination revealed an indefinite mass in the left upper quadrant and lumbar region. The hæmoglobin was 33 per cent. The temperature varied from subnormal to 102 degrees F. Cystoscopic examination showed moderate congestion of the bladder. Ureteral catheterization showed clear urine, but a moderate nephritis of the right kidney and an obstruction of the left ureter 25 cm. from the bladder. A roentgenogram revealed a large oval calculus in the left ureter. A pyelogram showed that the outline of the renal pelvis had been destroyed. On culture the urine from the right kidney was found to be negative but that from the left kidney showed staphylococci and short bacilli like the bacillus influenzae. The pre-operative diagnosis was impacted ureteral calculus and pyonephrosis.

An operation was performed Dec. 21, 1919, under nitrous oxide anaesthesia. An oblique lumbar incision exposed a mass of blood clot and pus surrounding the kidney. The kidney had a gangrenous appearance. The kidney and clots were lifted out, the kidney capsule being left. The blood vessels at the hilum were secured with two mattress sutures, and the wound was packed with gauze and partially closed with through-and-through sutures.

The operation required but a few minutes, but the patient's condition did not warrant further exploration.

This condition continued for two months, when an induration appeared beneath the surface of the wound, there was a foul discharge from the sinus, and a growth rapidly developed in the flank and increased in size until, at the time of death five months later, it extended below the ilium and filled the lumbar region.

The appearance on the surface was typically that of carcinoma. Microscopic study of this specimen showed well-nourished carcinoma cells around a large blood vessel. The tissue in the periphery was entirely necrotic.

In connection with this case the author emphasizes the following points:

1. Carcinoma of the kidney is rare, but does occur as a pathologic entity and must be differentiated from hypernephroma.
2. The diagnosis cannot be made before operation.
3. The rôle of infection and nephrolithiasis in the etiology is suggestive.

THEODORE DROZDOWITZ, M.D.

Curtis, F., and Potel, G.: A Suprarenal Tumor of the Abdominal Wall (Un cas de tumeur surrénale de la paroi abdominale). *J. d'urolog. méd. et chir.*, 1921, xi, 403.

A woman 68 years of age entered the hospital with an ovoid tumor in the epigastric region which had been present for six years but only recently had begun to bleed and increase in size alarmingly. This mass, which was very clearly pulsatile, lay trans-

versely above the umbilicus and was adherent to the overlying discolored skin.

On removal it was found to weigh 190 gm. and to be very extensively vascularized. The histologic examination showed that it contained all the elements of a suprarenal gland. There was not only a cortical layer but also a medullary zone and their relative proportions were normal. It was therefore diagnosed as a subcutaneous metastasis of a suprarenal tumor, probably a hypernephroma. The patient showed no sign or symptom of a deep tumor in the renal or perirenal regions and her complete postoperative recovery confirmed the conclusions drawn at the clinical examination.

The authors state that the subcutaneous insertion of a complete suprarenal and its neoplastic transformation have not been recorded in the literature previously. Their conclusions are as follows:

1. In the group of tumors originating from aberrant suprarenal anlagen a new variety is to be distinguished, viz., subcutaneous tumors of the abdominal wall.
2. These tumors, differing from those occurring in other regions, are formed by the union of the cortical and medullary substances of the normal suprarenal gland. They represent true aberrant glands transformed into neoplasms.
3. Embryology explains the production of these tumors and experiments demonstrate the survival of suprarenal tissue grafted in other regions.
4. The attention of surgeons should be drawn to certain tumors of a lipomatous and hæmorrhagic aspect in the abdominal wall which may be of suprarenal origin. In many cases these tumors may have been mistaken for lipomata of the abdominal wall.
5. Extreme vascularization and isochronous pulse expansion should attract the surgeon's attention because these occur in suprarenal tumors and are seldom noted in ordinary tumors of the subcutaneous cellular tissue.

W. A. BRENNAN.

Puppel, E.: Extravesical Implantation of a Simple, Non-Supernumerary Ureter and Its Treatment (Extravesicale Ausmuendung eines einfachen, nicht ueberzaehligigen Ureters und ihre Behandlung). *Zentralbl. f. Gynaek.*, 1921, xlv, 667.

Only 19 normally placed but extra-vesically implanted ureters have been reported in the literature. The author reports the case of a girl of 20 years who had suffered from leakage of urine from her childhood. The left labium majus was markedly swollen. Vaginal examination revealed the mouth of the right ureter emptying into the vaginal vault, while the cystoscopic examination showed only the mouth of the left ureter in the bladder. The demonstration of both ureters in the roentgen plate by means of collargol was impossible because the author was unable to pass the catheter into the right ureter beyond the region of the umbilicus.

Implantation of the right ureter into the bladder gave a good functional result. A cuff of vaginal

mucosa around the vaginal orifice of the abnormal ureter was excised, left attached to the ureter, and fastened by three sutures into an incision in the bladder. Seventeen such cases in which a vaginal operation was done are reported in the literature.

VORSCHUETZ (Z).

Coffey, R. C.: Transplantation of the Ureters into the Large Intestine in the Absence of a Functioning Urinary Bladder. *Surg., Gynec. & Obst.*, 1921, xxxii, 383.

During a series of very interesting experiments in bile-duct surgery on animals the author noted that whenever the duct was implanted directly into the duodenum it became greatly dilated in spite of the fact that there was no obstruction. This dilation was caused by a constant force which Coffey calls "static intra-intestinal pressure."

Looking further, he then found that the normal duct pierces the intestine to the mucosa and extends under the mucosa for some distance before it empties into the bowel. By the use of a rubber bag attached to an irrigator he proved that the closure of this opening was mechanical. Over the opening within the bag he cemented a rubber flap. The escape of water from the bag was prevented by the pressure within the bag against the flap. In a series of experiments in which the common duct was implanted just beneath the mucosa the absence of dilation was demonstrated.

In other experiments Coffey implanted the ureters of six dogs directly into the bowel following the same principles. Five of the animals died and the sixth showed dilation and thickening of the ureter and destruction of the kidney. In nine dogs the ureter was implanted by the submucous method. Five of the six dogs which recovered did not show dilation of the ureters or injury of the kidneys. The original technique is as follows:

The duct or ureter is ligated with linen or silk and then cut above the ligature. The wall is split with the scissors. A linen thread is passed through the split end about half way, tied, and then thrown around the other half and tied. The ends are threaded on needles. These are used for traction and to maintain the split. After the intestine has been opened to the mucosa for an inch or more, five or six sutures are passed through the peritoneal and muscular coats. The suture at the upper end is tied and used as a control.

The split end of the ureter with the traction thread and needles is passed under the sutures and inserted into the lumen of the intestine, through a stab-wound in the mucosa, the needles piercing the intestine $\frac{3}{4}$ in. beyond the end of the wound and $\frac{1}{4}$ in. apart. Tension on these threads pulls the ureter into the lumen of the intestine. The ends are tied on the outside. The intestinal sutures are then tied and the outer wall of the ureter is tacked to the intestinal peritoneum with fine thread.

C. H. Mayo has modified this technique by using fine catgut instead of linen, leaving out the upper

control suture, and using curved, rubber-covered clamps for the intestine and a continuous suture instead of interrupted sutures. He implants the right ureter low down into the rectum and at the same time fastens the parietal peritoneum to the intestine near the anastomosis. Ten to fourteen days later the left ureter is transplanted into the sigmoid. Judd transplants the left ureter extra-peritoneally.

In Osler's memorial volumes Mayo reported 52 cases. Of 6 patients operated on by the plastic method, 1 died six months later (traumatic exstrophy at childbirth). Among those operated upon by the Mandl-Moynihan method, 2 out of 3 died. In 22 of 26 cases treated by the transplantation method the results were successful. Seventeen were not operated upon for various reasons. Following operation a perforated rubber tube was used in the rectum.

The author reports 5 of his own cases. Two were cases of malignancy; 2, cases of exstrophy of the bladder; and 1, a case of marked contraction of the bladder due to ulceration. The functional results were good in every instance. The 2 patients with malignancy died ultimately of abdominal recurrence. In the case of contracted bladder one ureter which was greatly thickened and dilated was transplanted through the left rectus muscle. In this ureter there was good function, but the other one, which was implanted into the cæcum, ceased to functionate. The bladder symptoms were relieved.

The technique described differs from the Stiles operation in that in the latter the ureter is surrounded with the entire thickness of the intestinal wall. In the Fowler operation a flap of loose mucous membrane is used to cover the opening. In the Martin operation the intestinal muscle is employed to form a sphincter. Static intra-intestinal pressure is not considered.

An abstract does not do justice to an article of this type. The original paper should be read to be appreciated.

C. D. PICKRELL, M.D.

Robinson, A. L.: A Note on Injuries to the Female Ureter. *Brit. M. J.*, 1921, i, 665.

Injury to the ureter is one of the most common complications of pelvic surgery. The possibility of such injury is present in ligation of the ovarian and uterine vessels and in division of the attachments of the broad ligaments, cervix, vagina, and bladder. In Wertheim's operation full exposure of the ureter is necessary. Such dissection will be a valuable aid also in avoiding injury during operations on burrowing fibroids and intraligamentary cysts. The ureter may be identified by its peristaltic contraction, the absence of pulsation, and the consistency of its walls. The results of bilateral injuries are summarized as follows:

Double section: leakage with general infection and death.

Double ligation: anuria which is fatal if unrelieved. The treatment consists in releasing or im-

planting one or both ureters, or draining the kidneys by nephrostomy.

The results of unilateral injuries are:

Section: leakage; acute infection.

Partial section: subsequent leakage and fistula formation.

Ligation: atrophy of the kidney with or without symptoms of renal insufficiency (acute or chronic uræmia).

Ligation: reflex suppression with complete anuria.

In cases of bilateral ureteral occlusion immediate repair or implantation should be attempted. The ligation or division of one ureter leads to the temporary distention of the renal pelvis followed by renal atrophy. In a case of division of the left ureter and temporary occlusion of the right ureter with forty hours of anuria, the patient recovered after decapsulation of the right kidney; the right ureter again carried on its function. Early operation is recommended.

G. S. FOULDS, M.B.

BLADDER, URETHRA, AND PENIS

Rihmer, B.: Operations for Urinary Stones and Their Indications (Harnsteinoperationen und ihre Indikationen). *Orvosi hetil.*, 1920, lxiv, 305, 319, 329, 335.

Eighty-eight patients were operated upon for bladder stone. In 82 cases of typical high section or lithotripsy there were 4 deaths (4.8 per cent); 1 patient died later. The total mortality was 6.1 per cent. All of the deaths were those of patients subjected to section of the bladder (32 cases), but the number of recurrences was much greater in the cases in which lithotripsy was done.

Of the 21 cases of recurrence 5 followed section of the bladder, and 16 followed lithotripsy. This tendency to recurrence is the only disadvantage of lithotripsy. Section of the bladder not only has a much higher mortality but is frequently followed by stubborn fistulæ. Lithotripsy should not be used in cases which present great technical difficulties, such as a too large or too hard stone, a stone in a diverticulum, or a contracted bladder. It is contra-indicated also in cases complicated by cystitis, pyelitis, and nephritis.

Cases with severe infection should not be operated upon at all, especially if the patient is old. In the cases reviewed most of the deaths after operation for stone in the bladder were those of patients from 69 to 79 years of age who had severe urinary infection. Rihmer reports the following figures from the Hungarian Surgical Society for the year 1912:

Authors	High Section		Lithotripsy		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Makasch	37	9	30	2	67	2
Bakó	12	1	65	5	77	6
Dollinger	34	?	73	?	107	6
Habernern	20	1	11	1	40	2
Hensel	30	1	10	0	49	1
Huetl	10	3	7	1	17	4
Ilyés	13	2	90	1	103	3
Remete	26	2	90	2	116	4
Rényey	69	13	5	0	74	13

Rihmer emphasizes especially the importance of performing bladder section under local anæsthesia, and lithotripsy under parasacral anæsthesia. This assures freedom from pain. He recommends drainage of the bladder after section.

Twelve operations were done for urethral stone; five of these were in the prostatic part of the urethra. In the latter, two stones were pushed back into the bladder, one was crushed, one was removed by bladder section (an incrustrated piece of bone in a case of gunshot wound of the pelvis), and the rest were removed by incision in the bulb of the urethra. There was 1 case of true stone of the prostate. Only part of this calculus was removed; a fistula remained. In another case a fistula remained after the removal of a stone from the pendulous part of the urethra by external urethrotomy.

In 49 operations performed on 46 patients for kidney stone there were 3 deaths (6.1 per cent). Five nephrolithotomies were performed with primary suture. Following one of the latter it was necessary to remove the kidney secondarily on account of hæmorrhage. In 3 nephrolithotomies with drainage there was one death, due to pneumonia. Of 2 patients subjected to nephrostomy, 1 died but was in a septic condition at the time of the operation. Bilateral nephrostomy was done in a case of infected hydronephrosis following incarceration of stone. There were 2 pyelotomies and 25 nephrectomies. Fourteen of the latter were done for pyonephrosis. Among these cases there was one death, due to septic pneumonia.

Fever with chills and anuria is regarded as the vital indication for operation. Operation is recommended also for all cases in which there are large stones in the kidney pelvis. Pyelotomy is the procedure of choice as it is much less dangerous than nephrotomy. Nephrotomy should be done only when the stone cannot be reached from the kidney pelvis and causes frequent colic, suppuration, and hæmorrhage.

Nephrectomy is the only operation for pyonephrosis. In 3 of the 6 cases of stone in the ureter the stone passed down the ureter spontaneously after injections of oil or glycerine. In 1 case it was incarcerated in the vesical part of the ureter and was removed by high section; the patient recovered. Death occurred in 2 cases in which nephrostomy was performed for stone on account of sepsis or anuria of six days' duration.

PÓLYA (Z).

Peters, W.: Tuberculosis of the Penis (Die Tuberkulose des Penis). *Beitr. z. klin. Chir.*, 1921, cxxii, 647.

Tuberculosis of the penis or the urethra as a phase of urogenital tuberculosis is more frequent than was formerly supposed. Usually it is overshadowed by the associated processes. Primary urethral tuberculosis, however, is rare. By children it is acquired at circumcision; by adults, in sexual intercourse or through the blood. It sometimes occurs in association with gonorrhœa or lues.

To the two cases of hæmatogenous tuberculosis of the penis reported in the literature which were primary in the sense that no other localization of the disease could be discovered, the author adds a case of his own. At the external orifice a tuberculous ulcer was found, and 6 cm. back of this, a stricture of the urethra. The use of Pezzer's retention catheters and X-ray treatment caused improvement and rendered the patient free from pain.

The development of secondary tuberculosis of the penis is relatively common when the rest of the urogenital tract is involved by the disease. The extension may occur by way of the lymph stream or along the surface of the mucous membrane. Injuries of the epithelium such as those which may be caused by catheterization favor the localization of the tubercle bacilli even when there is no other predisposing condition. Urethral strictures may develop on a purely tuberculous basis and cause urinary extravasation and the formation of urinary fistulæ.

KOENIG (Z).

GENITAL ORGANS

Randall, A.: The Varying Types of Prostatic Obstruction. *J. Urol.*, 1921, v, 287.

This article is based on a series of more than 800 autopsies. The author states that, generally speaking, only three different types of changes are found in the prostate: (1) glandular hyperplasia, (2) fibrosis, and (3) neoplasms. He has drawn this conclusion chiefly from intensive study of clinical material before operation and of specimens removed at the operating table. In the 800 cases which came to autopsy he examined the prostate, the bladder, and their adnexa. The bodies were those of patients of various ages but the majority were those of old persons. The fact that they suffered from urinary obstruction during life was evident from the clinical picture, the cystoscopic findings, and the anatomicopathologic changes found especially in the bladder, ureters, and kidneys.

The cases are divided into four groups to demonstrate the varying pathology more clearly: (1) those of generalized prostatic hypertrophy, (2) those in which only the median bar was hypertrophied, (3) cases of median-bar obstruction; and (4) cases of malignant growths.

The author next discusses the types of hypertrophy of the first group from their earliest manifestations to hypertrophic growths of large size, going into detail regarding the mechanism of the obstruction and its pathology. There were 29 cases of simple lateral-lobe hypertrophy and 22 cases of trilobar hypertrophy, the median and both lateral lobes showing definite enlargement.

Randall agrees with Thompson that the so-called middle lobe is a pathologic product derived from one or both lateral lobes and is non-existent in the normal prostate. There were over 42 cases of hypertrophy of the median lobe alone in the series

and in 22 instances hypertrophy of this lobe was associated with lateral-lobe enlargement (true trilobar hypertrophy). Median-lobe involvement was present, therefore, in 64 cases. The ages of these patients ranged from 35 to 85 years.

The term "median-bar obstruction" is used to designate obstruction to the bladder which cannot be accounted for by lateral- or middle-lobe pathology. The two distinct pathologic changes causing it are, first, true fibrosis, and second, localized hypertrophy. The fibrotic and hypertrophic forms may be differentiated cystoscopically. The true fibrotic bar should be destroyed, while the elevated vesical lip, the sclerosed sphincter, the narrowed orifice, and the tortuous urethra should be rectified. This may be accomplished by fulguration, a punch operation, or open dissection. A possible fourth method consists in cautery destruction in an open operation. The type due to hypertrophy of gland tissue calls for closer study and nicer operative choice. When the hypertrophy is in the subcervical glands alone, and when it is discrete, partially pedunculated, superficial, and not too large, the punch operation should remove all of it, but when it is in the posterior prostatic commissure, deep seated, rounded, and broad based, open operation is essential, complete enucleation or cautery destruction being called for.

The frequency with which cancer was found in the series of cases reviewed is not a true indication of the occurrence of this condition in operative cases because the material was not systematically sectioned for microscopic study. Its incidence in the grossly pathologic specimens was only 4 per cent.

E. F. HESS, M. D.

Benjamin, A. E.: The Technique and After-Treatment in Operations on the Prostate. *J.-Lancet*, 1921, n.s. xli, 247.

The first step in prostatic surgery is the building up of kidney function. Daily catheterization will gradually relieve renal tension and suppression following the preliminary cystotomy. A retained catheter is usually of great benefit. Preliminary stock or autogenous vaccines are of value in cases of severe infection.

After the usual preliminary operative treatment the patient is placed on a specially constructed apparatus which separates the legs, and the abdominal wall is opened to the bladder under local anæsthesia. Three stay sutures are inserted, the third being placed transversely to cut off the space of Retzius. The bladder wall is opened under continued local anæsthesia or anæsthesia induced with gas followed by ether. The capsule is incised at its most prominent point and the prostate removed. The second assistant, who stands between the patient's legs, elevates the prostate through the rectum. Excessive bleeding is controlled by means of sutures or, if necessary, with gauze.

In the postoperative treatment a retained catheter and a double drainage tube, each of which is

connected with a bottle, are used. The catheter is held in place by a catgut suture which passes out between the drainage tubes. Gentle irrigations are employed to keep the bladder free from clots and to prevent infection. The catheter is retained after the tubes are removed to promote union. Antiseptic and astringent dressings are of value.

C. D. PICKRELL, M.D.

Gordon, G. S.: Some Unfortunate Sequelæ of Suprapubic Prostatectomy. *Canadian M. Ass. J.*, 1921, xi, 323.

The sequelæ in question are due to continued obstruction to urination and manifest themselves as dysuria with or without associated lithiasis and the more remote consequences of back-pressure, chronic uræmia and chronic septic absorption. The author contends that a certain degree of obstruction persists after most prostatectomies, but is usually overlooked by both the patient and the surgeon.

The degree of obstruction and the character of a local concurrent infection determine the severity of the symptoms. Phosphatic stone may form in a residual urine pouch back of the obstruction. Obstruction may be so marked that the urine merely dribbles or is evacuated only through the suprapubic fistula. Urinary back-pressure from obstruction causes the persistence of back-pressure uræmia and under these conditions the walls of the upper urinary tract are less resistant to infection, septic products are absorbed, and chronic toxæmia results.

In a paper read in 1915 and published in *SURGERY, GYNECOLOGY AND OBSTETRICS* in May, 1916, the author called attention to the rôle of the internal sphincter of the bladder in cases of postoperative obstruction. He states that after prostatectomy there remains dorsally and laterally to the vesical outlet a flap of bladder wall which is covered by the trigone and mucous membrane above, is denuded below, and is unsupported by its previous prostate contact. At its free edge is the vesical outlet which is closed normally by the contraction of certain circular fibers of the bladder wall — the so-called internal sphincter. The anterior attachment of these sphincteric bundles is undisturbed at prostatectomy, and resumption of function, which follows promptly afterward, draws the free margin of the undermined vesical flap forward.

This flap is bounded by the vesical orifice anteriorly, the ureteral orifices posteriorly, and the margins of bladder attachment laterally. Below is the prostatic cavity into which, because of the weight of the urine above, the central part of the flap bellies. This is what happens after prostatectomy unless the internal sphincter has been destroyed, and it is in this pouch above the flap that residual urine stagnates and, when there is infection, stones form. The sphincter edges which have been denuded at operation may become coapted and stricture may develop at this point. In other cases the edges may heal solidly together in this position and cause absolute retention.

The results of the remedy suggested for this condition by the author and later independently by Denslow of Kansas City are satisfactory so far as postoperative obstruction is concerned. Gordon's remedy is described as follows:

After the new growth has been enucleated in prostatectomy, the margin of the internal sphincter which lies between the bladder and prostate cavity is caught in a forceps, slit on each side with the scissors, and the bladder flap thus freed is applied to the floor of the prostate cavity by drawing a Hagner's bag into the prostatic urethra. This bag holds the flap in place and stops bleeding. A more simple procedure which may be used is the Denslow or Thomson-Walker technique in which a single slit is made in the midline of the sphincter, two lateral triangular flaps being thus formed instead of a single quadrilateral flap.

If this precaution is taken at prostatectomy the base of the bladder will be on a level with the outlet, there will be no residual urine to perpetuate infection or favor the formation of stones, no straining to urinate with its resultant back-pressure, and less tendency to protrusion of hæmorrhoids or hernia.

E. F. HESS, M.D.

Walker, J. W. T.: The Prevention of Urinary Obstruction After Prostatectomy. *Lancet*, 1921, cc. 1008.

The author reports sixteen cases of obstruction to the urinary outflow after prostatectomy which was caused by the formation of the fibrous tissue either at the junction of the prostatic cavity and the bladder or at the ureteral end of this cavity. The former was the most common. Cases of obstruction due to portions of the prostatic lobe left behind or to recurrence after removal of a malignant growth of the prostate are excluded.

Failure in the primary operation may be attributed to inexperience or lack of skill on the part of the operator and to the type of enlargement in the gland removed at the primary operation. Obstruction more often follows removal of the small fibrous type of gland.

The treatment of obstruction by means of sounds is unsatisfactory. The author carefully removes all scar tissue from the abdominal wall, dissects the bladder free from the posterior surface of the symphysis pubis, and, with the patient in the Trendelenburg position, carefully dissects out all the fibrous tissue from the prostatic area.

To prevent obstruction after the primary operation the prostatic area must be well exposed, bleeding controlled, and any tags of prostatic capsule or mucous membrane which might later cause obstruction must be removed. G. S. FOULDS, M.B.

Schultz, O. T., and Eisendrath, D. N.: The Histogenesis of Malignant Tumors of the Testicle. *Arch. Surg.*, 1921, ii, 493.

Following the dicta of Ewing, all malignant tumors of the testicle have been considered hereto-

fore as teratomatous. Schultz and Eisendrath, however, describe several classes as follows:

"In malignant tumors of the testicle, heterologous tissues may be present or absent. In the former case the teratomatous nature is established. Tumors without heterologous elements may or may not be derived from teratomata.

"In malignant tumors whose teratomatous origin is undoubted the atypical tissue usually has a glandular character suggestive of derivation from hypoblastic epithelium. In a certain proportion of tumors without heterologous tissue the atypical tissue is of the same glandular character. Such tumors are derived from hypoblastic epithelium whose proliferation has suppressed or overgrown such teratomatous structures as may have been present, or the malignant proliferation may have begun so early that differentiated mixed tissues were not formed.

"In another group of tumors the atypical tissue may have the characteristics of chorionic epithelium. In about half of the reported tumors of this group heterologous elements were present and established the teratomatous origin. Chorioma arises from the trophoblastic constituents of a teratoma. This may occur at so early a stage that histoid or organoid structures have not been formed, or at a later stage. In the latter case the heterologous elements may persist or they may be overgrown by the choriomatous tissue.

"In a small group of tumors origin from the epiblastic constituents of a teratoma appears probable. The atypical tissue may have the structure of basal-cell carcinoma or of neurocytoma.

"For those tumors whose teratomatous origin is either definitely established by the presence of heterologous elements or is rendered very probable by the character of the atypical tissue, the designation "embryonal carcinoma" should be accepted. This term may be modified by the term "hypoblastic," "trophoblastic" or "epiblastic" if the atypical tissue is glandular, syncytial, or solid.

"Quite distinct from the embryonal carcinomata are the tumors of the solid, medullary, large-cell type. The distinguishing characteristic of these tumors is the cell type. The tumor cell is morphologically identical with the younger cells of the spermatogenic cycle and is probably derived from the cells of the seminiferous tubules. For this kind of tumor the term "spermatocytoma" is suggested.

"In our series none of the tumors which we have considered to be spermatocytomata contains any heterologous elements, nor does the atypical tissue have the morphology of that of any of the embryonal carcinomata.

"In our series the age incidence of spermatocytoma is distinctly higher than that of the embryonal carcinoma; the clinical duration is shorter and the course is more rapid." V. D. LESPINASSE, M.D.

SURGERY OF THE EYE AND EAR

EYE

Landolt, M.: Self-Inflicted Eye Injuries. *Am. J. Ophth.*, 1921, iv, 345.

Cases of conjunctivitis found among troops and due to soap were detected by means of a 2½ per cent solution of sulphate of zinc which formed with the soap a white precipitate, probably zinc oleomargarate.

Eye injuries were inflicted also by means of cigarette ash, ipecac, and fragments of castor bean. The latter produced a white eschar at spots opposite each other on the palpebral and ocular conjunctiva but these are not easily mistaken. Corneal opacities were produced with acetate of lead.

The case is reported of a young man of high social and military standing who presented himself with a linear perforation ½ cm. in length at the lower limbus of the globe. He explained that the wound was due to falling on a penknife and was very anxious to know if it would produce a traumatic cataract. A cataract did not develop. Six months later an exactly similar wound occurred in the same eye and the admission was obtained that both perforations had been made with a penknife by the man himself in order to evade military service.

S. S. HOWE, M.D.

Pyle, W. L.: Report of a Series of Remarkable Cases of Injury to the Eyeball. *N. York M. J.*, 1921, cxiii, 816.

Case 1 was that of a young man who was struck in the eye by glass from a broken car window, one piece of which completely penetrated the cornea. When this fragment was removed the anterior chamber was completely evacuated. Recovery was rapid. Complete vision with correction was 6/5.

Case 2 was a case of traumatic conjunctivitis with an entropion and resulting traumatic pterygium.

Case 3 was that of a boy who received a penetrating wound of the upper lid and severe contusion of the eyeball from an air-rifle bullet. Both aqueous and vitreous contained blood and the pupil was oval and did not dilate readily even under the continued use of atropine. Recovery was complete but vision could not be increased beyond 6/12.

Case 4 was that of a boy who was shot in the eye with B.B. shot from an air gun at short range, receiving a severe contusion of the eyeball with extensive subconjunctival hemorrhages. There was such haziness of the media that ophthalmoscopic examination was impossible. The pupil was irregularly dilated. The lens gradually became completely opaque and then became absorbed so that at the end of the treatment, nearly a year after the accident, vision in the injured eye, with glasses, was 6/12.

Case 5 was that of a man who had a small foreign body, probably emory, in the eye attached to the pupillary margin of the iris. This foreign body was so small that X-ray plates were inconclusive. A cataract gradually developed, but as the eye remained quiet an attempt at removal of the foreign body was not made immediately as it was thought that on removal of the lens the foreign body could be removed also.

T. D. ALLEN, M.S.

Wiener, A., and Bonime, E.: Sympathetic Ophthalmia: Report of a Case Successfully Treated. *Arch. Ophth.*, 1921, l, 43.

Ten years before the patient was first seen by the authors his left eye had been injured by scissors. Six years later the right eye was hit by a baseball. From the date of the first injury there were attacks of iridocyclitis in the left eye. Enucleation was therefore advised. After the sixth year the right eye suffered similar attacks. When the patient was first seen, vision was 20/200 in the right eye and 20/70 in the left, and the whole anterior segment of the right eye presented all the signs of a plastic iridocyclitis. A complete physical examination revealed nothing of significance.

An iridectomy on the right eye was followed by intensive constitutional treatment. This resulted in improvement in vision to 20/30 in the right eye and 20/50 in the left. The right disc then showed a low-grade optic neuritis, but without an ascertainable reason repeated attacks of inflammation occurred and whenever a surgical attempt was made to free the pupil there was an immediate reaction which closed the opening. Vision was finally reduced to perception of light. A band keratitis finally developed in both eyes and the patient became helpless.

A course of intravenous and subcutaneous vaccination with typhoid, and autogenous streptococcus and pneumococcus vaccine was given. When an iridectomy was again done on the right atrophic iris no reaction occurred. The lens was removed by discission. Just behind it a whitish exudate was found. An opening effected with a fine needle knife gave vision of 15/100.

S. S. HOWE, M.D.

Mosher, H. P.: The Mosher-Toti Operation on the Lachrymal Sac. *Laryngoscope*, 1921, xxxi, 284.

The first step of the Mosher-Toti operation on the lachrymal sac is the removal of the anterior end of the middle turbinate.

The second step is the exposure of the lachrymal sac. An incision is made about 6 mm. from the inner canthus of the eye, beginning at the level of the crease in the upper eyelid, which marks the summit of the globe, and running downward to 2 ro 3 mm.

below the inner end of the lower rim of the orbit. The sac is exposed and turned from its bed by elevating the periosteum of the orbit from above downward and 2 or 3 mm. beyond the crest of the lachrymal bone until the beginning of the nasal duct is seen clearly.

In the third step the lachrymal bone is broken down in front of the crest, an opening is made into the nose equalling at least the height and width of the sac, and the inner wall of the nasal duct is then bitten away with a small conchotome to the level of the upper rim of the inferior turbinate.

In the fourth step the inner half of the lachrymal sac and the inner wall of the soft tissues of the nasal duct are removed, the region of the nose opposite the opening in the bone is made free from tags and overlapping ethmoidal cells, the tissues are replaced, and the skin is sutured.

The Mosher-Toti operation differs from the original Toti operation in that no attempt is made to join the lachrymal sac to the nasal mucous membrane by making equal and opposite openings in each and anastomosing them by sutures. The sac, as a sac, is destroyed, only the essential part of it, the outer wall and punctum, being preserved. The nasal mucous membrane exposed by the bone opening is also sacrificed.

The advantages claimed for the operation are that it cures the epiphora, is simple to execute, and is done entirely by sight. S. S. HOWE, M.D.

Roberts, B. H. S.: A Series of Cases of "Glass-Blowers' Cataract" Occurring in Chainmakers. *Brit. J. Ophthalm.*, 1921, v, 210.

During the last few years the author has collected notes of about twenty-five cases of cataract in men and women engaged in chainmaking. In every instance a posterior polar or cortical opacity of a type closely resembling that occurring in glass-blowers was present in one eye or in both.

Chain is made by hand, the work being a specialized type of blacksmithing, and the workers gaze all day without protection either into the fire or at the white-hot metal. It is believed that many more are affected than come for treatment as it is a matter of common belief among the workers that their sight will fail between the ages of 50 and 60.

In all the cases in which the fundi could be seen nothing abnormal was found. S. S. HOWE, M.D.

Zbikowski: Changes in the Position of the Lens (Cambios de posición del cristalino). *Rev. méd. de Sevilla*, 1921, xl, 1.

After briefly discussing the types and the usual immediate and predisposing causes of lenticular dislocation the author presents four cases.

He states that the lens is kept in the fossa patellaris by the consistency of the vitreous and the tenseness of the suspensory ligament. This equilibrium may be broken by: (1) distension, stretching, or rupture of the zonula, (2) alteration in the con-

sistency of the vitreous, and (3) alteration in the intra-ocular pressure.

Dislocations may be divided clinically into two classes depending upon whether the lens remains clear or becomes cataractous and whether the dislocation is acquired or congenital. In all congenital subluxations there is always a developmental defect in the zonula.

Case 1 was that of a woman 45 years of age who gave a history of head injury and complained of attacks or crises of pain. A dislocated lens was found which moved from the posterior to the anterior chamber with the movements of the head. The pain was due to traction on the ciliary body. Only the nucleus of the lens remained, the lens being therefore able to pass through into the anterior chamber. Following extraction of the lens from the anterior chamber there was complete relief from pain.

Case 2 was that of an undernourished child, 12 years of age, who complained of attacks of pain and vomiting. Both eyes were buphthalmic, the right being absolutely blind but not painful. The left eye, which was painful, was slightly enophthalmic and showed a large ectasia of the sclera contiguous to the corneal limbus. Focal illumination showed the upper inner edge of the lens to be dislocated into the anterior chamber. A 5 per cent euphthalmic hydrochloride solution was instilled in the eye and the patient put to bed. In twenty-four hours the lens had returned to the posterior chamber. The eye was then put under eserine. The general health improved and the attacks of pain disappeared. The scleral ectasia and the change in the anterior segment of the eye explain the stretching and degeneration of the zonula which allowed the lens to change its position.

Case 3 was that of a boy who was struck in the left eye about three months previously with a straw hat. The pupil was widely dilated and at one point the iris was bound to a linear scar at the limbus by a foreign body which proved to be the nucleus of the lens.

Case 4 was a case of luxation of the lens beneath the conjunctiva due to a blow which squeezed the globe between the bony orbit. The lens was incarcerated in scar tissue between the limbus and the insertion of the rectus muscle.

S. A. SCHUSTER, M.D.

Derby, G. S.: Intra-Ocular Foreign Body, a Surgical Emergency. *Am. J. Ophthalm.*, 1921, iv, 334.

In every injury of the eye the possibility of an intra-ocular foreign body should be considered. The site of a perforation is often overlooked, especially if it is in the conjunctiva, and it is not so very rare to find a small foreign body where careful previous inspection did not reveal the presence of a penetrating wound.

Because of the danger of infection or later fixation by exudate, the extraction of a magnetic foreign body should be performed as soon as possible.

The author deplors the tendency to accept a negative X-ray report as final, as a small foreign body may escape the ray just as a small wound in the eyeball may escape observation.

The one indispensable test to determine the presence of a foreign body in the eye is the use of the magnet.

A foreign body which is not too large should be drawn around the lens into the anterior chamber as posterior puncture of the eyeball associated with hæmorrhage and the formation of fibrous bands frequently leads to detachment of the retina.

S. S. HOWE, M.D.

Hartshorne, I.: Traumatic Rupture of the Internal Carotid into the Cavernous Sinus. *Am. J. Ophth.*, 1921, iv, 353.

A school girl, 12 years of age, fell down a bank and struck her head against a stone wall. There was no bleeding from the nose, throat, or ears, and no vomiting. She regained consciousness quickly. Within twenty-four hours, however, marked exophthalmos of the left eye developed with complete ptosis of the left eyelid and extensive swelling and subcutaneous hæmorrhage on the left side of the face.

Ten days later the eye was protruded about 5 mm. and showed complete ophthalmoplegia. Examination of the eye was practically negative. Seven days later a bruit was noted over the left eyeball and temple. This stopped when compression was applied to the left internal carotid artery.

Eight days later the internal carotid artery was tied. The improvement, which was gradual, began

with the internal rectus. In about a week the exophthalmos was reduced to 2 mm. and the lower edge of the upper eyelid rested across the pupil. The features of special interest were:

1. Entire absence of noises in the head.
2. Absence of dilatation of the conjunctival veins and of the naso-frontalis and angular veins at the internal angle of the orbit.
3. Complete ophthalmoplegia.
4. The transmission of the pulsation to the internal jugular vein of the neck on the same side instead of to the eyeball.
5. Recovery with excellent vision.

S. S. HOWE, M.D.

Huerta, A.: A Case of Hypopyon Treated with Milk Injections (Un caso de hipopión curado con inyecciones de leche). *Semana méd.*, 1921, xxviii, 502.

Huerta reports the case of a farmer who was struck in the eye with a piece of wire. Marked inflammation with hypopyon developed.

Ten cubic centimeters of boiled fresh cow's milk were injected in the gluteal region and hot applications applied to the eye. The injection was followed by a temperature reaction but the next day the hypopyon was reduced and the pain had disappeared. The injection was repeated for five days. The eye then cleared up completely, except for a traumatic cataract.

The author believes the result was due to a non-specific foreign protein reaction.

S. A. SCHUSTER, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Mudd, S., Grant, S. B., and Goldman, A.: *The Etiology of Acute Inflammations of the Nose, Pharynx, and Tonsils. Ann. Otol., Rhinol. & Laryngol.*, 1921, xxx, 1.

The authors investigated the rôle of chilling in acute inflammations of the upper respiratory tract. In well-controlled experiments with ingenious use of thermogalvanometry they found that chilling of the body surface is followed by reflex vasoconstriction, ischæmia, a fall in the temperature of the skin and the mucous membranes of the nose and oropharynx, and blanching. The blood temperature was not notably altered. While the skin temperature quickly became normal or above when the subject was warmed, the depression in the temperature of the mucous membranes persisted considerably longer, except in the tonsils.

This local ischæmia and chilling, the authors believe, lowers local resistance and allows bacterial over-growth and the development of infection. Their bacteriological studies, though not conclusive, support this belief.

After a rather detailed discussion of recent work the authors conclude that the other factors of importance in the production of "common colds" are: (1) infection by the filterable virus of Kruse and Foster of relatively high virulence; (2) infection, pure or mixed, by a heterogeneous group of bacteria of varying virulence; (3) protein sensitization; (4) various systemic diseases; drugs; mechanical, chemical, and thermal trauma; chronic nasal infections; and reflex neuroses.

T. C. GALLOWAY, M.D.

THROAT

Thomson, St. C.: *Intrinsic Cancer of the Larynx: the Usual Site of Its Origin as Demonstrated at 50 Laryngofissures, and Its Influence on Diagnosis, Prognosis, and Treatment. Brit. M. J.*, 1921, i, 921.

It is evident that many of the failures in early efforts to cure intrinsic cancer of the larynx by laryngofissure were due to delayed diagnosis. Earlier diagnosis has led to a steady diminution in the number of cases for which complete laryngectomy is the only possibility.

Mackenzie, in his textbook published in 1880, laid more emphasis on late than early symptoms, such as huskiness or hoarseness. His statement that the site of the tumor is in most cases on one of the ventricular bands was also misleading. Semon showed that the intrinsic form of laryngeal cancer is more common than the extrinsic and that the

cords are the parts most frequently affected. He was misled, however, by Virchow who taught that benign growths have a tendency to localize on the front parts and that one should regard with suspicion growths on the posterior parts and interarytenoid region, especially if the patient is well advanced in years.

The results of the author's observations demonstrate that intrinsic cancer does not show a preference for the posterior part of the vocal cord and that the interarytenoid region is probably rarely affected as he has never seen such a case. His conclusions are drawn from 50 cases in which the diagnosis was based, not only on the appearance reflected in the laryngeal mirror, but also on direct inspection at laryngofissure and by microscopic examination.

These 50 cases he tabulates according to the invasion of the cord by the neoplasm as follows: (1) the anterior third only, 3 cases; (2) the middle third only, 7 cases; (3) the posterior third only, no cases; (4) the anterior and middle thirds, 16 cases; (5) the middle and posterior thirds, 3 cases; and (6) the whole cord, 21 cases. Extension occurred to the anterior commissure in 6 cases, to the posterior commissure in none, and to the subglottic area in 13. Expressed with regard to the cords, the anterior third was invaded in 39 cases, the middle third in 47, and the posterior third in 24 cases.

The growth was found in the subglottic area in 13 of the 50 cases and more commonly in the anterior half.

Horne pointed out that tuberculosis attacks by preference that area of the larynx which is covered with columnar epithelium and is richest in glandular structure, whereas epithelioma shows a preference for the part which is covered with squamous epithelium and is relatively free from glands. The posterior half supplies the former conditions and the anterior half the latter.

Thomson's conclusions are summarized as follows:

1. Intrinsic cancer of the larynx originates on the vocal cords or in the subglottic area.
2. It was not found in the posterior commissure or originating from the ventricular bands or the ventricle of Morgagni in 50 cases carefully examined both indirectly with the mirror and by direct inspection after splitting of the larynx.
3. A malignant growth may originate in any part of a cord, but is more common in the central portion or anterior half than in the posterior area of the larynx.
4. An epithelioma originating in this region remains for a long time limited to the cord affected and the adjoining side of the larynx, but may cross the anterior commissure and, in later stages, invade the arytenoid and the area to the outer side of it.

5. The inner surface of the cord may be affected primarily or by extension. The subglottic area may be invaded by a growth originating in a cord. A cancer may start also below the level of the cords in the subglottic area.

6. A subglottic cancer is much more common in the anterior than in the posterior half of the larynx.

7. The most favorable prognosis may be given in cases of superficial or projecting tumors of limited extent.

8. Tumors situated in the middle third or anterior half of the cord are more favorable than those invading the anterior commissure in front or the arytenoid region behind.

9. Growths embedded in a cord or extending into it below an intact mucosa are not so favorable.

10. An epithelioma extending along the inner margin of a cord is still less favorable.

11. Subglottic cancers are very unpromising as regards lasting cure by laryngofissure. They are frequently associated with impaired mobility or complete fixation of the cord.

12. In every case, however limited the growth, the entire vocal cord should be excised from the anterior commissure up to, and including, the vocal process of the arytenoid.

13. The growth should be removed in one mass with as wide a margin of apparently healthy tissue all round it as possible. The excision should therefore go down to the lower edge of the subglottic area. Above, it should pass through the healthy ventricular band, and externally it must include the perichondrium lining the thyroid ala.

14. To facilitate this the thyroid ala should be removed so that the laryngofissure will be really a partial hemi-laryngectomy.

FRENCH K. HANSEL, M.D.

Diggle, F. H.: The Diagnosis and Treatment of Cancer of the Larynx. *Practitioner*, 1921, cv1, 347.

Before entering upon the chief phase of his topic, the diagnosis and treatment of cancer of the larynx, Diggle reviews briefly the lymphatic supply of the larynx as this has a very important bearing on the general behavior of malignant growths in this region.

Within the larynx there are two more or less distinct sets of lymphatics separated by the true vocal cords. The area above the vocal cords is rich in lymphatics, whereas that below is rather poorly supplied. The two areas are in communication posteriorly and over the edge of the vocal cords. The posterior communication is free, but that over the cords is very sparse. The lymphatics of the one side anastomose freely with those of the opposite side in the region of the arytenoids, but only sparingly at the anterior ends of the cords.

The supraglottic network communicates with the lymphatic system of the base of the tongue and pharynx, while the subglottic passes imperceptibly into that of the trachea.

The supraglottic area is drained into the cervical chain at the level of the hyoid bone, whereas the subglottic area drains into the inferior cervical group of glands just above the clavicle.

These findings explain the following facts:

1. Growths above the cord tend to spread toward the superior aperture of the larynx.

2. Growths below the cords tend to spread toward the trachea.

3. Extension to the opposite side generally occurs posteriorly around the arytenoids.

4. Owing to the fact that the lymphatics are relatively few, growths of the true cords remain localized for a considerable time.

5. Because the afferent lymphatic vessels are few and small, growths in the interior of the larynx *per se* are very late in producing glandular enlargement. This is one of the most important points to bear in mind.

6. When once the base of the tongue and pharynx is invaded, glandular involvement and local extension rapidly ensue.

After discussing in detail the various symptoms, the laryngoscopic appearance, and the palliative measures for dyspnoea and dysphagia, pain, sepsis, and hæmorrhage in the inoperable cases, the author concludes his article with the following warnings:

1. Be suspicious of persistent hoarseness in a person near the fiftieth year of age.

2. Regard as serious slight discomfort in swallowing of unknown origin, especially in a female.

3. Do not expect early and rapid glandular involvement.

4. Do not exclude malignancy because of the absence of sanious expectoration.

5. Regard as malignant until proved otherwise, especially in a patient about 50 years of age: (1) unilateral congestion of a vocal cord, (2) a papilloma on a vocal cord. Sluggishness in movement of the cord should increase suspicion.

6. In early cases laryngofissure gives excellent results with preservation of the laryngeal framework and a useful voice.

O. M. ROTT, M.D.

Hill, F. T.: A Report of a Case of Dislocation of the Epiglottis. *Laryngoscope*, 1921, xxxi, 320.

In the author's case difficulty in breathing and hoarseness had been present for two years following violent throttling. These symptoms could not be explained until in a laryngological examination the epiglottis was found lying horizontally with its tip touching the posterior pharyngeal wall.

Under cocaine anaesthesia the tip of the epiglottis was removed and an incision was made to the base in the median line. This left a notched epiglottis the lateral borders of which were pulled up by subsequent contraction. The functional result was good, there being no difficulty in swallowing.

T. C. GALLOWAY, M.D.

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INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1921

COLLECTIVE REVIEW

TUBERCULOSIS AND PREGNANCY¹

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THE determination of the relation of tuberculosis to pregnancy requires discussion from many angles. It necessitates an inquiry into the manner in which the pregnant state differs from the non-pregnant state; the transition to the pregnant state and back again after pregnancy has terminated; the manner in which these changes affect the tuberculous patient directly and indirectly; the manner in which the tuberculous patient adjusts herself to these conditions; and the conditions affecting the child.

When we consider the importance of the subject we are struck with the meager discussion which it has received in the literature of tuberculosis.

When a woman becomes impregnated, forces are set into motion which change her completely for the time being and make her chief function for the succeeding nine months the care and development of the impregnated ovum until a fully developed child is formed.

Physiological equilibrium is maintained through the nervous and endocrine systems. The dominance of various internal secretions varies at different age periods. Prior to the time of puberty, the normal child is unaccustomed to those secretions which preside over sexual and procreative functions. When puberty is attained, however, these forces assert themselves so dominantly that they then modify all the acts of life. The growth and development of the individual to a state of manhood and womanhood and a condition of independency of parents with the potential power of assuming the duties of parent-

hood depend largely upon the entrance into the blood stream at this time of internal secretions from the sex glands, secretions with which the body has heretofore been unacquainted. These cause the growth which makes the transition from childhood to adult life and are responsible also for impulses of a psychical nature which assert themselves and influence, in some instances dominate, the individual.

These new forces are usually introduced gradually and the organism adapts itself to the physiologically changed conditions without great shock. When established, the resultant condition, which differs in the two sexes as is readily apparent, is maintained throughout sexual life.

It is impossible for a dominant secretion like that of the ovary or testicle to be introduced into the blood stream without stimulating other glands of internal secretion and influencing the nervous system. In fact, there seems to be a close relationship between the gonads, the pituitary, the thyroid, and the adrenals. The organism accommodates itself to the internal secretion of the gonads by an adjustment of those secretions which have been present heretofore. Puberty, therefore, is a time when the equilibrium of the nervous and endocrine systems is disturbed.

When the activity of the gonads is once established it continues during the major portion of life. In woman, ovarian secretion, as far as its relation to menstruation is concerned, is in abeyance during pregnancy and after the menopause, and at each of these times readjustment of physiological equilibrium is necessary.

¹ Read before Obstetrical Branch of Los Angeles County Medical Society, California, April 12, 1921.

A few of the important changes may be mentioned. The ovary has an important function in regard to the elimination of calcium from the body: when it is active, calcium elimination is favored; when it is inactive, calcium is retained. This is important because calcium has an important influence on nerve irritability. Pregnancy is accompanied by an increased activity of the thyroid, and the small chromophobe cells in the pars anterior of the pituitary change to large chromophobe cells called "pregnancy cells." These changes call for a physiological readjustment which is made easily or with difficulty according to the usual nerve and endocrine balance of the individual.

It seems natural to assume that resistance to disease is intimately associated with nerve and endocrine balance as all functions of the body, including defense, are physiological. It is equally natural to assume that the powers of defense will vary as this physiological balance changes, being at times below normal and, perhaps, at other times above normal. So far as possible, therefore, we must inquire into these conditions and see what relationship they bear to the progress of such an infection as tuberculosis.

Pregnancy is a time when woman is called upon to perform her supreme duty to the race. That being true, we should expect forces to be set in motion which would prepare her for this ordeal; it would be reasonable to expect a heightened state of nutrition and a generally improved dynamic tone. Such changes are often observed in the general improvement in nutrition which takes place after the nerve unbalance of the early weeks has been overcome. It is shown also in what seems to be a heightened resistance to acute infections. That this is not always the case is true, but it must be remembered that all women are not naturally of normal nerve, endocrine, psychical, and physical balance. Regardless of what might seem to be exceptions, it is plain that the female of the species, whether animal or human, is protected and prepared in a remarkable manner for this drain of forming the child and the strain of bearing and caring for it. This protection, however, is not necessarily sufficient to overcome all opposing forces.

The first strain upon the pregnant woman is associated with the sudden cessation of the menstrual function, the withdrawal of the normal internal secretion which accompanies ovulation, and probably the injection of new secretions which arise from the fecundated ovum. The symptoms differ greatly according to the manner in which the woman has been influenced by the

ovarian secretion. A hyperovariac becomes adjusted with greater difficulty than a hypo-ovariac, and a woman who is strongly vagotonic seems to become adjusted with greater difficulty than one who is a sympathicotonic.

As a part of this change in equilibrium the thyroid and pituitary are stimulated, the forces of nutrition are augmented, calcium is stored in the body, and after adjustment has been completed the normal woman enters upon a period of well-being. Because of the disturbances in physiological equilibrium and the necessity for making adjustments, pregnancy in a tuberculous woman must be looked upon as a matter of great seriousness as her powers of adjustment are greatly disturbed by the disease.

The questions which are of special interest in discussing pregnancy in those affected with tuberculosis are: (1) the frequency of tuberculosis of the genital organs; (2) the effect of tuberculosis upon pregnancy; (3) the effect of tuberculosis in a pregnant woman upon the unborn child, and later, upon the born child; and (4) the effect of pregnancy upon the tuberculous process.

TUBERCULOSIS OF THE FEMALE GENERATIVE ORGANS

Tuberculosis of the female genital organs is not common. Rueder (1) quotes the following statistics:

Von Hasselmann found it in 18 of 450 women who died of tuberculosis, and Schramm found it in 34 of 3,386 women. Simmonds found it in 88 of 6,000 women who died of various causes, and Martin found it in 24 of 1,600 women. This gives a percentage of genital tuberculosis amounting to 1.5 among tuberculous women and 1.36 among all women examined. Tassoni (2), reporting from the obstetrical and gynecological clinic in Rome, stated that he found genital tuberculosis in 9 of 948 women (about 1 per cent).

Therefore we may say that the incidence of tuberculosis of the female genitalia is not much greater in tuberculous women than in non-tuberculous women.

THE EFFECT OF TUBERCULOSIS IN INTERRUPTING PREGNANCY

The effect of tuberculosis in producing abortion and miscarriage is evident when large numbers of statistics are analyzed. Weinberg (3) cites the statistics of Fellner (4, 5) who analyzed the pregnancies of 223 tuberculous women and compared them with those of Fuerst's 6,402 healthy women as follows:

Premature births:	Tuberculous, 223		Non-tuberculous, 6,402	
	No.	Per cent	No.	Per cent
Stage of pregnancy				
Last month.....	25	11.2	325	5.1
Second half.....	48	21.5	217	3.4
First half.....	13	5.8	23	.4
		38.5		8.9

These figures show that 38.5 per cent of tuberculous women as compared with 8.9 per cent of non-tuberculous women were unable to carry the child to term. The tendency to abort is particularly great in advanced tuberculosis. McGoldrick (6) states that when the mother has mild tuberculosis abortion will occur in 15 per cent of the cases, and when her disease is advanced, abortion will occur in 33 per cent.

THE EFFECT OF TUBERCULOSIS IN THE PREGNANT WOMAN UPON THE CHILD

The next question of interest is the effect of tuberculosis in the pregnant woman upon the child. This question must be discussed in two phases: the effect of the disease upon the development of the child *in utero*, and its effect upon the child after birth.

The fact that there is a greater tendency to abortion and premature birth in tuberculous than in non-tuberculous women suggests that the child of the tuberculous woman does not have the same chance for life and consequently does not have the same vitality as the child of the non-tuberculous woman. This fact is shown further in the greater percentage of still-born babies and the greater percentage that die during the first year of life when the mother is tuberculous. The death rate is particularly high when the mother suffers from tuberculous laryngitis. Kuttner (7) reports that 40 of 66 children whose mothers died of tuberculous laryngitis died at, or soon after, their birth.

Weinberg quotes Van Winkel who states that the statistics of several authors studied by him showed death of the child in 37 per cent of the cases of tuberculous mothers.

Needless to say, the percentage must differ greatly according to the mother's social and economic conditions and the care given her and the child, but especially according to the stage of the disease with which the mother is affected. The further advanced and the more active lesions give a much worse *a priori* prognosis for both the child and the mother.

Weinberg analyzed the statistics of married women who died of tuberculosis in Stuttgart from 1873 to 1902. He found that 339 women who had died of tuberculosis within a year after giving

birth to a living child had given birth to a total of 343 children, of whom 22 (6.4 per cent) were still-born. The rate of still-births for all women of Stuttgart for the same period was 3.5 per cent or just about one-half as great. Of 57 children born to 56 women who died of tuberculosis within twenty-six days of delivery, 10 (17.5 per cent) were still-born.

The danger that the child will be born with a tuberculous infection is comparatively slight. Only a sufficient number of authentic cases of children born with a tuberculous infection have been reported to prove that such a thing is possible. A tuberculous mother may give birth to a child free from infection whose strength may be equal to that of a child born of a non-tuberculous mother. The analysis of many statistics shows that the strength of the child differs according to the extent and degree of activity of the tuberculosis in the mother. The danger of infection after birth, however, is very great when the mother is suffering from open tuberculosis. The danger to the child from tuberculosis in the family is well shown in the statistics of Riffel (8).

Riffel analyzed the records of 716 families which extended over a period of two hundred years. In these 716 families 3,911 children were born, of whom 173 (4.4 per cent) were tuberculous.

In 606 families in which both parents were free from tuberculosis, 3,274 children were born, of whom 100 (3.05 per cent) were tuberculous.

In 35 families in which the father was tuberculous, 149 children were born, of whom 11 (7.38 per cent) were tuberculous.

In 60 families in which the mother was tuberculous, 399 children were born, of whom 36 (9.02 per cent) were tuberculous.

In 19 families in which both parents were tuberculous, 119 children were born, of whom 26 (21.85 per cent) were tuberculous.

Of 606 families with healthy parents, children were tuberculous in 73 (12.05 per cent).

Of 31 families with a tuberculous father, children were tuberculous in 8 (25.81 per cent).

Of 60 families with a tuberculous mother, there were tuberculous children in 28 (46.67 per cent).

Of 19 families in which both parents were tuberculous the children were tuberculous in 11 (57.89 per cent).

INFLUENCE OF PREGNANCY UPON TUBERCULOSIS

It seems strange that there should be grounds for divergence of opinion upon the question as to whether tuberculosis is harmed or helped by pregnancy, yet this question has always been

discussed pro and con by men of eminence in the profession. The difference depends greatly upon the conditions under which the patients have been observed.

Prior to the middle of the last century it was commonly taught that tuberculosis was benefited by pregnancy. In fact, I have seen patients even within the last few years who had been advised to become pregnant that they might have the benefit of pregnancy in curing their tuberculosis. Clinicians of fame, such as Rokitansky and Liebermeister, were of the opinion that pregnancy checked the progress of tuberculosis. In the middle of the last century, Louis, after observing unfavorable results, called for new observations and an impartial discussion of the subject. At about the same time Grisolle (9) seems to have been able to turn the tide of opinion and to do much toward establishing the fact that pregnancy exerts a harmful influence upon tuberculosis. However, it is only within the past few decades that this opinion has predominated in medicine.

Weinberg quotes the observations of the following clinicians to show the effect of pregnancy upon the disease:

	Tuber- culous women	Those who died No.	Per cent	Time of death with regard to delivery
Grisolle..	27	8	30	Within four months
Lebert...	25	18	72	Within one year
Van Ysen- dick...	26	14	54	Within two years
Kaminer..	23	14	61	

Maragliano (10) compared groups of pregnant tuberculous and non-tuberculous women who had the same degree of pulmonary trouble and found that 94 per cent of the former had died in a given time while only 18 per cent of the others had succumbed.

It is a general observation among tuberculosis specialists that a large percentage of women patients trace the activation of their disease to a pregnancy. This percentage varies greatly with the character of the clinical material.

Maragliano found that 59 per cent of his tuberculous women patients dated their disease to a pregnancy; Jakenbasch found 24 per cent; Jacob and Pannwitz (11) found 84 of 357 or 23.5 per cent, and Norris 39 per cent.

The mortality is especially high among pregnant women with complicating tuberculous laryngitis. Mosher (12) quotes Imhofer as stating that in such cases it is 86 per cent, and Kuttner as reporting it as 90 per cent.

Von Jaworski (13) and Van Amstel (14) in recent papers emphasize the injurious effects of preg-

nancy upon tuberculosis and bring together the experience of many able clinicians which shows that the percentages of cases in which the tuberculous process was made worse were as follows:

	Per cent
Bardeleben.....	80
Bollenhaugen.....	68
Fellner—Schauta	68.3
Hofbauer.....	55
Kaminer.....	66
Miesowicz.....	78
Neltner.....	67
Pankow—Kuepferle.....	90
Bruïne Ploos Van Amstel.....	100
Pradella.....	90
Reiche.....	77
Von Rosthorn.....	100
Zirkel.....	34.48
Von Jaworski.....	77

Norris and Landis (15) report 85 cases from the Phipps Institute and 18 from Norris' private practice. Of the patients treated at the Phipps Institute 2 became worse and 6 died, making the number of those who became worse during the pregnancy equal to 10 per cent. Of Norris' 18 patients 5.55 per cent were apparently improved, the condition of 22.2 per cent remained apparently unchanged, 61.11 per cent were made worse, and 11.11 per cent died as a result of the pregnancy.

The difference in these statistics depends, as the authors state, upon the fact that in the private cases the tuberculosis specialist is usually called in late in the pregnancy and finds an advanced disease, while in the institutional cases the condition is more favorable as the result of treatment. The Phipps statistics, however, are probably better than those for institutionalized tuberculous women in general.

THERAPEUTIC ABORTIONS

Because of the serious effect of tuberculosis complicated by pregnancy upon the mother, interruption of pregnancy has now become the common rule in the treatment of tuberculous women, but if we follow up the after-history of these cases we cannot be other than convinced that even this measure fails in a large percentage of cases and that the best way to safeguard the tuberculous woman consists in preventing conception. Gerhardt (16) suggests sterilization. While I think wholesale sterilization is uncalled for, I believe it is the duty of the physician to teach the tuberculous woman how to prevent conception, and in certain instances to do a sterilization.

The average patient with active tuberculosis, whether it be in the early or the late stage of the

disease, is compelled to put up a hard fight to regain health. When the strain of pregnancy is added, a strong adverse factor is injected. This factor varies greatly according to the extent and severity of the lesion, and according to the patient's natural resistance, economic status, and ability to secure proper treatment for the tuberculosis and proper obstetrical care.

The high death rate is due largely to the deaths of patients who were suffering from active tuberculosis when pregnancy began. We would not expect such a high death rate in quiescent or arrested cases nor among patients who are properly treated for the tuberculosis and at the same time given careful obstetrical care. Even at best, however, pregnancy is a complication which must be considered as extremely hazardous for a tuberculous woman. Maragliano has been so impressed with its injurious influence in such cases that he says all sentiment should be thrown aside and pregnancy should be interrupted in the interest of the mother as soon as a diagnosis is made.

Unfortunately the interruption of pregnancy does not always check the tuberculous process. Moreover it cannot be expected to do so for there are active cases which are able to withstand neither the strain of pregnancy nor the strain of its interruption. However, while interruption of pregnancy sometimes fails, it offers the patient the best chance to overcome her disease. The favorable effects are most evident, as would be expected, in the early cases. In these, improvement of the tuberculosis usually follows. The procedure is least beneficial in the advanced cases, many of which are apt to go on to increased activity. It can be said of the latter type of patient, however, that her chances are undoubtedly improved by the operation. If all tuberculous women could be given adequate treatment for the tuberculosis immediately following the interruption of the pregnancy, the results would doubtless be more favorable.

The results of interruption of pregnancy upon the tuberculous process are given in the statistics of Pankow and Kuepferle (17, 18) as follows:

GROUP 1.—INTERRUPTION OF PREGNANCY BEFORE THE FOURTH MONTH

Stage of tuberculosis	Cases	Deaths	Condition				Cases	Per cent
			Progressive	Stationary	Per cent	Improved		
I	61	..	6	10	11	44	72	
II	5	1	1	40	..	3	60	
III	2	2	..	100	..	..	..

GROUP 2.—INTERRUPTION OF PREGNANCY BETWEEN FIFTH AND SEVENTH MONTHS

Stage of tuberculosis	Condition improved Per cent	Condition progressive Per cent
I	66.6	33.3
II	20.0	80.0
III	...	100.0

GROUP 3.—NATURAL PREMATURE DELIVERY

Stage of tuberculosis	Deaths Per cent	Condition		
		Progressive Per cent	Stationary Per cent	Improved Per cent
I	33.3	..	33.3	33.3
II	100.0	..	...	...
III	50.0	..	...	50.0

ARTIFICIAL PREMATURE DELIVERY

Stage of tuberculosis	Deaths Per cent	Condition		
		Progressive Per cent	Stationary Per cent	Improved Per cent
I	...	50	..	50
II	40	20	..	40
III	100	..	..	..

These statistics show that early tuberculosis goes on favorably after the interruption of pregnancy in 87.9 per cent of the cases, and that 33.3 per cent of moderately advanced cases and 29.4 per cent of far advanced cases are benefited. They show further that the most favorable time for interference is during the first few months. The percentage of cases benefited would be markedly increased if the interruption could take place within the first two months of pregnancy. Interruption between the fifth and seventh months is less favorable, and artificially induced premature labor is the least favorable.

COURSE OF DISEASE AFTER INTERRUPTION OF PREGNANCY

Stage	Unfavorable Per cent	Favorable Per cent
I	12.1	87.9
II	66.0	33.3
III	70.6	29.4

These statistics indicate that the pregnancy should be interrupted early. However, the question as to whether interference is necessary in every case must be answered in the negative for no rule in clinical medicine is absolute. My experience teaches me that women suffering from early active tuberculosis may go on to full term unharmed when they receive proper treatment for their tuberculosis, are given skillful medical care during pregnancy and after confinement, and are relieved of the care and the nursing of the child. Nevertheless, I feel that the woman who follows such a course is taking serious chances. Meissen (19), after a large experience, takes the same view.

These statements do not mean that tuberculous women whose disease has been arrested cannot bear children. When the disease has remained arrested for two or three years I see no reason why one whose disease was not too far advanced cannot bear children if she is properly attended during the pregnancy. - However, a tuberculous woman should be satisfied with one or two children, and two or three years should elapse between the pregnancies. She should also be spared the strain of nursing the child.

In the preparation of this paper I am particularly indebted for much statistical information to the exhaustive studies made by Van Amstel, Weinberg, and von Jaworski.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Hagentorn, J. E.: A New Operative Method for the Removal of Foreign Bodies in the Gluteal Region and for Exposure of the Sciatic Nerve and the Hip Joint (Eine neue Operationsmethode zur Entfernung von Fremdkörpern aus der Gesaessgegend, Gesaessschambeingegend, zur Freilegung des Nervus ischiadicus und des Hueftgelenks). *Akad. Chirurg. Klin. milit. med. Akad.*, Petrograd, 1920.

Because of the difficulty of removing foreign bodies from the region of the buttocks the author made a special study of this region in order to work out some practical method of operating without causing serious secondary injuries. The incisions through the muscle structures which have been used up to the present time do not permit a satisfactory operation at a depth, and a deeply implanted foreign body may be easily overlooked, the examining finger being deceived by muscle bundles and fascia. Secondary injury to important nerves and vessels may also result. The author's method is as follows:

The cutaneous incision as far as the fascia begins from the center of the Roser-Nélaton line between the antero-superior iliac spines and the great trochanter and extends in an arch over the thigh, somewhat below the apex of the trochanter, to the anal fold, and thence over the reverse side of the upper thigh 1 cm. below the plica narium. The skin edges are retracted about 2 cm. from the fascia on both sides and a Kocher probe then inserted between the gluteus medius and the upper edge of the gluteus maximus which the gluteus medius only partially covers. This probe is introduced in such a way that it undermines the muscle about 2 cm. above its insertion into the tractus ileo-tibialis fascia. The gluteus maximus is transversely sectioned over the probe; hæmorrhage is not to be feared. The skin and muscle flap is easily turned back upward and with it the gluteal vessels and gluteal nerve. In the operative field the sciatic nerve, the sciatic artery, and the posterior femoral cutaneous nerve are visible. In the lower border of the turned-back muscles the pudendal artery and nerve are seen through the lesser sciatic notch.

This approach also opens a wide and clear route to the hip joint. After the necessary operative procedures the sectioned gluteus medius muscle is joined with two mattress sutures and interrupted sutures. A drainage tube is left in the lower posterior angle of the wound for twenty-four hours.

The author has performed this operation in 6 cases. The conditions for the healing of the sectioned

gluteus muscle are very good as the vessels and nerves have not been injured. After healing, the functioning of the muscle is perfect. *BUSCH (Z).*

Gallie, W. E., and LeMesurier, A. B.: The Use of Living Sutures in Operative Surgery. *Canadian M. Ass. J.*, 1921, xi, 504.

During the course of an experimental and clinical study of the conversion of the tendons of paralyzed muscles into ligaments, which was made several years ago, the authors observed that however greatly the tendons were deprived of their blood supply, they continue to live, and when examined months and years later presented the same glistening white appearance and the same histologic characteristics as normal tendons. This observation suggested the possibility of using free transplants of tendon or fascia in operations in which it is desired to fasten together structures which naturally tend to separate. Accordingly they have experimented on animals and have made careful clinical observations to throw light upon this subject. The experiments included the transplantation of pieces of fascia, aponeurosis of muscle, and tendon and the repair of gaps by means of strips of fascia used as sutures.

The conclusions drawn from this study are summarized as follows:

1. When a piece of fascia, aponeurosis, or tendon is cut free from its circulation and transplanted in the same animal in such a way that it can receive an adequate supply of lymph, it will continue to live and, for all practical purposes, will remain unchanged.

2. During the first few weeks following the operation an inflammatory reaction occurs in the tissues surrounding the transplant which results in its complete investment in a vascular areolar membrane and in its healing to those tissues with which it comes into immediate contact.

3. Such transplants heal to the surrounding structures by means of newly formed connective tissue, and it is upon the strength of this connective tissue that the firmness of the fixation of a transplant depends. If the operation is performed without the complete removal of the areolar tissue which normally ensheathes the transplant the union will have the strength only of the areolar tissue. If, on the other hand, the areolar membranes are completely removed and the transplant and the surrounding tissues are placed in actual contact, the nature of the union will be in the form of a fibrous scar and its strength is therefore materially increased. However, as scar tissue is very apt to stretch under even moderate degrees of strain, it is

essential to place the transplant in contact with the surrounding tissues over a considerable distance in order that the amount of scar tissue in the line of union may be sufficiently strong to withstand any degree of physiological strain.

4. In many cases the mechanical difficulties in placing the transplant in actual contact with the surrounding tissues over large areas are so great that the method becomes valueless in ordinary operative surgery. These difficulties, however, can be completely overcome by employing fascia or tendon as a suture and weaving it securely into the surrounding tissues. The necessity for removing the areolar membranes from the surfaces is then eliminated and dependence for the success of the operation need no longer be placed upon the healing of the transplant to the surrounding tissues as the strength of the bond of union will depend upon the strength of the transplant itself and the structures into which it is woven. If the surgeon is careful to choose for the living suture a material which is known to have the necessary strength to withstand the anticipated strain, and if the tissue is securely anchored into tissues which also can tolerate this strain, the permanent union of these tissues may be confidently expected.

The authors call attention to the failures in attempts made to repair large ventral herniæ with patches of fascia lata. These patches were cut to fit the opening in the abdominal wall or made to overlap its edges slightly, and then fastened into place with catgut or linen sutures. The failure in such cases was due to the weak character of the healing at the edges of the transplant. To such insecure union may be attributed most of the failures in operations in which transplanted fibrous tissues have been used.

The authors describe the application of the principles mentioned to various operations, the repair of injured ligaments, the formation of new ligaments for the prevention of paralytic deformities, and the operations for recurring lateral dislocation of the patella and hallux valgus, in all of which the results were very successful. While they suggest also the possibility of applying them to the various types of visceroptosis, floating kidney, malpositions of the uterus, and undescended testis, they state that probably they will be found of greatest value in the repair of hernia.

To date the authors have operated upon 30 cases of hernia. A few of these were cases of recently acquired direct inguinal hernia or supposedly inoperable ventral hernia. One was a case of recent indirect inguinal hernia in a man with complete flaccid paralysis of the abdominal muscles. Beyond the removal of the sac the treatment in these cases consisted in repair of the weak abdominal wall with living sutures of fascia lata. The sutures were about 7 in. long and $\frac{1}{4}$ in. thick and were threaded on a curved large-eyed needle and woven into the edges of the surrounding muscles and aponeurosis. No attempt was made to drag the structures into which

they were woven out of their normal position, as is frequently done in ordinary operations; only sufficient tension was employed to make the sutures lie flat. Thus the success of the operation depended not upon inducing such structures as the internal oblique muscle or the conjoined tendon to heal to Poupart's ligament, but solely upon the strength of the living suture and its firm grip on the surrounding tissues. There has been no recurrence.

FREDERICK CHRISTOPHER, M.D.

ASEPTIC AND ANTISEPTIC SURGERY

Schmerz, H.: Pregl Solution in Surgery (Die Preglsche Loesung in Dienste der Chirurgie). *Muenchen. med. Wchnschr.*, 1921, lxviii, 696.

Pregl solution was employed to disinfect the hands in one-hundred operations and although the operations were done without gloves the results were very good. The solution is absolutely non-irritating and has the advantage that it removes dried blood very easily. Its principal value, however, is not its bactericidal power—as even by this method of cleansing complete freedom from bacteria cannot be obtained—but its tissue-protecting power. Disinfection of the operative field with Pregl solution after benzine cleansing has apparently given excellent results.

In aseptic operations gauze strips soaked in the solution may be used to prevent both drying and infection of the wound. Silk soaked in the solution was found especially suitable for fascial plastics and the suturing of large fat flaps. Transplants immersed in it immediately before implantation healed into place very quickly. In cases of sinous operative wounds a tampon soaked in the solution was placed in the cavity and the skin closed over it, the tampon being removed forty-eight hours later. In this way an aseptic wound closure was obtained.

In surgery in septic conditions suppurative glands were excised and the cavity packed with gauze soaked in the solution; after two or three days the wound had become absolutely clean and suturing was followed by primary healing. Pus collections in the abdominal cavity, especially in appendicitis and gastric perforations, were wiped out and the cavities washed with tampons soaked in the solution. In such cases the impression was gained that the solution was much superior to ordinary physiological salt solution. In the so-called "creeping" peritonitis the effects of Pregl's solution were very striking. In addition to its use to disinfect the peritoneal cavity it was given also intravenously. As it is almost non-irritating it is especially suitable for bladder lavage, only tuberculous cystitis appearing to be refractory to it. Also in the treatment of surgical tuberculosis the results were less certain, but osteomyelitic foci cleared up with remarkable rapidity under this treatment.

Intravenous injections of the solution were used successfully for the treatment of varicose veins. Close examination showed the absence of marked

changes in the intima. The solution was employed through the general circulation also to influence general septic processes with the result that healing was obtained in certain cases which were not affected by colloidal silver. The author states that it is still to be determined whether the solution can be employed intravenously in phlegmonous processes.

SCHUBERT (Z).

Churchman, J. W.: Sterilization of Closed Cavities by Lavage and Staining with Gentian Violet: Description of Technique. *J. Am. M. Ass.*, 1921, lxxvii, 24.

The author has shown in previous publications that joints may be sterilized by lavage and staining if the infection has not persisted too long. The procedure employed for this purpose included preliminary mechanical cleansing of the surface of the synovial membrane and the introduction of a penetrating, persisting, non-irritating substance of moderately strong bacteriostatic power (gentian violet). The entire operation was performed under local anaesthesia through a large-bore needle.

In this article Churchman describes a new apparatus he has recently devised which not only facilitates the procedure much more than the apparatus formerly used but is suitable also for the treatment of infections in the thoracic cavity. He states, however, that the problem of infections within the chest is by no means as simple as that of infections within joints, and that there is not the slightest reason to suppose that lavage and staining would be of any avail in an empyema of long standing or that the procedure described should supplant a thoracotomy in such cases. In cases of early effusion the method has been encouraging.

FREDERICK CHRISTOPHER, M.D.

ANÆSTHESIA

Bartlett, W.: An Estimate of the Value of Local Anæsthesia in the Surgery of To-Day. *Surg., Gynec. & Obst.*, 1921, xxxiii, 27.

Bartlett discusses the methods of inducing local anaesthesia which he considers practical, safe, and fairly easily acquired, and calls attention to the six methods of employing local anaesthetic agents of today: (1) direct infiltration of the field; (2) circular infiltration around the field; (3) nerve blocking, in which the agent is injected around or directly into an isolated nerve; (4) intravenous injection; (5) arterial injection; and (6) surface application. He states that for the purposes of general surgery our attention may be confined to the first three procedures as the intravenous method has a narrow field, the arterial method is attended by obvious disadvantages, and surface anaesthesia is used only in the limited surgical specialties.

It is early noted that there is a marked individual difference among patients with regard to sensibility to pain stimuli which is dependent largely upon race, nationality, sex, state of health, fatigue, age, intelligence, character, training, and surrounding influence.

To be acceptable, a local anaesthetic agent must fulfill certain requirements. It must be soluble in water, it must stand boiling, it must combine with adrenalin, it must not be more than mildly toxic, it must not be irritating during injection, and it must not produce permanent injury to the tissues. Exhaustive experiments have shown that novocaine, now produced in this country under the name of "procaine," fulfills all these requirements better than any other drug. In experiments on animals the author found it only one-tenth to one-fifth as toxic as cocaine. It is non-irritating and produces absolutely no tissue damage. Large quantities, however, may cause death. In such cases respiration ceases long before the heart stops beating. Six ounces of a ½ per cent solution of novocaine poured into the peritoneal cavity of a 15-lb. dog caused death from respiratory failure in about twenty minutes. Naturally enough, a drug which produces death may be said to exert a general effect when used as a local anaesthetic. Bartlett has used 8, 10, 12, and in a few instances 16 oz. (500 to 1,000 c.cm.) of a ½ per cent infiltration solution without observing serious toxic consequences. If a very large amount is used it must be injected over a considerable period of time and absorption must be delayed with adrenalin.

Tissue changes which have been attributed to local agents have been due to the fact that isotonic solutions were not used. It is obvious that novocaine or any similar agent should be dissolved in physiological salt solution rather than in sterile water.

Following a discussion of the effect on different tissues and the advantages, indications, and contra-indications of local anaesthesia the author describes at length the technique he employs.

ISABELLA I. HERB, M.D.

Baruch, M.: Direct Abdominal Anæsthesia (Ueber eine direkte Anaesthesie der Bauchhöhle). *Zentralbl. f. Chir.*, 1921, xlviii, 821.

Instead of blocking the intercostal and lumbar nerves or the coeliac plexus, the author makes a subumbilical injection of 600 c.cm. of ¼ per cent novocaine-adrenalin solution into the abdominal cavity by means of a cannula needle (the Goetze pneumoperitoneum cannula). In two cases good anaesthesia of the parietal peritoneum was obtained, but the effect on the viscera was unsatisfactory. The author recommends further experimental work with larger injections and a stronger solution as after the abdomen is opened a considerable amount of the solution drains away.

HARMS (Z).

SURGERY OF THE HEAD AND NECK

HEAD

Eagleton, W. P.: Fracture of the Skull: Importance of the Early Diagnosis and Operative Treatment of Fracture of the Skull, with Chart of Clinical Classification and Treatment and Guides for Detailed Neurological Examination. *Arch. Surg.*, 1921, iii, 140.

Fracture of the skull with injury to the cerebral tissue or infiltration of blood into the brain substance causing prolonged increase of the intracranial pressure is frequently followed by gliosis.

Fractures of the skull should be divided primarily into: (1) simple and (2) compound fractures. In simple fractures the surgical manipulations are limited to the relief of intracranial pressure and the prevention of gliosis, while in compound fractures they include also the prevention of intradural sepsis.

Unrecognized fractures of the base at times are responsible for persistent vertigo.

The principles underlying the treatment of fractures of the skull should be:

1. Repeated routine recording of the blood pressure. A rising blood pressure or a disproportionately increasing pulse pressure calls for immediate operation, while diastolic pressure below 55 is a contra-indication to operation.

2. Routine examination of the eyes. The development of papilloedema not accounted for by a vascular lesion calls for immediate lumbar puncture to determine whether or not there is hæmorrhage within the dura. The presence of blood in the cerebrospinal fluid suggests fracture but does not call for operation.

3. Routine neurological examination in all cases of suspected fracture.

All wounds of the scalp should be excised, the area of excision being extended to allow investigation of the bone directly beneath and in the immediate vicinity of the wound. In the presence of a linear fracture the area should be excised and the fracture converted into a simple fracture through primary closure.

Routine X-ray examination should be made in suspected cases of fracture of the skull.

The clinical classification and the treatment of fractures of the skull are summarized as follows:

A. Simple fractures may be divided into:

1. Simple linear: (a) without symptoms. Treatment: prolonged rest. (b) with symptoms of compression. Treatment: operation for relief of compression by: (1) removal of extradural clot with control of hæmorrhage by ligation or obliteration; (2) decompression; and (3) lumbar and ventricular puncture.
2. Simple depressed: (c) with or without cerebral symptoms. Treatment: operation for elevating or removing depression with or without repair of dura; relief of compression.

B. Compound fractures may be divided into:

3. Compound linear: (d) without cerebral symptoms. Treatment: operation for immediate conversion of the compound fracture into a simple fracture by excision. (e) with symptoms of compression. Treatment: operation for immediate conversion of the compound fracture into a simple fracture by excision of skin and bone; relief of compression.
4. Compound depressed: (f) with or without cerebral symptoms. Treatment: operation for conversion of the compound fracture into a simple fracture by excision; elevation or removal of depression; relief of compression, control of hæmorrhage; repair of dura; closure of defect; drainage, when necessary, by stab wound away from defect.

The detailed neurological examination should include the general symptoms, the localization of lesions in the cerebrum, and cranial nerve involvement.

Nine cases are reported. C. R. STEINKE, M. D.

Ballin, M.: A Method of Cranioplasty Using as a Graft One-Half of the Thickness of the Bony Part of a Rib. *Surg., Gynec. & Obst.*, 1921, xxxiii, 79.

Ballin uses the following method in closing in a skull defect:

The graft is procured by exposing one or two ribs on the side of the thorax through a flap incision and excising a quadrilateral piece of the pectoral fascia somewhat larger than the skull defect to be covered.

The rib is exposed by pushing the muscles aside. The periosteum is incised along the upper margin of the rib and the outer half of the rib is chiseled off so that the inner half is left intact upon the pleura. Grafts may be taken from two or three adjoining ribs if necessary in order to cover a large skull defect.

The skull defect is exposed by a quadrilateral flap, the dura is separated from the periosteum around the edges of the defect, and the edge of the bone is removed for $\frac{1}{4}$ in. around the entire periphery. The fascia transplant is then placed over the exposed brain, pushed underneath the bone edge, and smoothed out.

On opposite sides of the defect the outer and inner tables are separated by driving the chisel lightly between them, along the exposed edge of the diploe.

The rib grafts are put in place by simply inserting each end in the prepared slot.

The advantages of this method are:

1. Both fascia and bone are obtained from the same location.
2. A graft consisting of only half the thickness of the rib has a considerable degree of springiness and elasticity and therefore can be molded.
3. No foreign material is used to fix the graft.

H. A. MCKNIGHT, M. D.

Sachs, E.: The Diagnosis and Treatment of Brain Tumors. *J. Missouri State M. Ass.*, 1921, xviii, 217.

Sachs lays stress on the sequence of symptoms as an aid to the diagnosis and localization of tumors of the brain. This is often of vital importance as it may indicate where the lesion started.

Headache is very constantly associated with brain tumors, but is of no value as a localizing symptom.

Of the various aids in making a focal diagnosis none is of greater value than a careful study of the perimetric fields.

The X-ray is a very valuable aid and may reveal:

1. General signs of increased pressure. The appearance of the so-called "pressure" skull is characteristic.

2. Separation of the sutures in children or young adults.

3. A significant conformation of the dorsum sellae. When there is general increased pressure the dorsum sellae may be thinned and pressed forward, while in lesions originating in the sella turcica—pituitary tumors—the dorsum is pushed backward.

4. In tumors in the cerebello-pontile region, particularly acoustic nerve tumors, an enlarged internal auditory meatus. This may be revealed by comparative studies of stereoscopic plates.

In the treatment of brain tumors the fact must be recognized that a certain number of cases cannot be permanently cured. It therefore remains for the surgeon to decide in which cases he should carry out a palliative procedure and in which he should attempt radical treatment. The subtemporal decompression operation should be performed only in those cases of brain tumor in which no localization of the lesion is possible and as a preliminary step before radical operation in cases of localized brain tumors.

H. A. MCKNIGHT, M.D.

Fischer, J.: Brain Tumor and the Auditory Organs (Hirntumor und Gehörorgan). *Monatsschr. f. Ohrenh.*, 1921, lv, 371.

The author gives a résumé of the otological findings in 126 cases of brain tumor observed in the Eiselsberg Clinic. These show the importance of a careful otological examination in the diagnosis of such growths. In 44 cases the frontal and middle cranial fossæ were involved. In 77 per cent of these there were cochlear and vestibular disturbances. The decrease in auditory power was usually progressive. In 9 cases there was labyrinth disturbance, hyper- or hypo-irritability associated with vertigo and disturbance of equilibrium. The last symptom mentioned is of diagnostic value as indicating a frontal tumor although in some instances a tumor in this area may be confused with a cerebellar process.

The most common tumors of the posterior fossa are those of the cerebello-pontile angle. These usually originate in the sheath of the auditory nerve. Their diagnosis is relatively easy and they are

amenable to operation. Of 27 cases, 26 showed more or less complete homolateral deafness; in the one exception the growth was only as large as a pea. The ear symptoms begin with head murmurs. Large tumors may affect both ears. In 74 per cent of the cases the labyrinth showed complete lack of response to stimulation. Spontaneous nystagmus and disturbances of equilibrium were frequent but past-pointing was seldom present. Tumors of the cerebello-pontile angle which do not originate in the auditory nerve cause variable symptoms.

In cases of tumors of the pons and the medulla oblongata, especially when the foramen Magendi is occluded, the general symptoms of internal hydrocephalus are more prominent and the ear symptoms less noticeable. In cases of cerebellar tumors the ear findings vary and the clinical showings are more variable than in cases of acoustic tumors. Falling toward the affected side is a sign of special diagnostic importance. Bárány past-pointing was noted in only 2 of 16 cases. Therefore it is of little diagnostic value.

In conclusion Fischer mentions 34 cases showing the syndrome of brain tumor in which no tumor could be found either at operation or at autopsy.

KOENIG (Z).

Blumenthal, A.: Otogenous Brain Abscesses (Ueber otogene Hirnabscesse). *Monatsschr. f. Ohrenh.*, 1921, lv, 302.

According to their etiology, otogenous brain abscesses may be divided into those which arise from the dura and those due to thrombosis of veins. In cases of the first type there are adhesions between the dura, meninges, and the diseased parts of the brain, but in those of the second type these may be absent. The object of operation is to provide a drainage outlet within the adhesions between the meninges and the surface of the brain and in cases in which there are no adhesions to cause their formation as rapidly as possible. The author states that the incision should always be made in the line of greatest pressure and, if possible, within adhesions. The drainage material also should be placed in the direction of the greatest tension. Gauze should be used and should always be loosely packed.

The prognosis of hæmatogenous abscesses is unfavorable because they are often situated in areas very difficult to drain. They are frequently multiple, and as a rule they are associated with some other condition such as thrombosis of a sinus.

MEYER (Z).

Raynaud: Occipital Encephalocele; Operation; Recovery (Encephalocèle occipitale; opération; guérison). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 696.

Raynaud removed an occipital encephalocele from an Arab male infant aged four months. The pedicle of the tumor was ligated and severed without opening the tumor. The child made an excellent recovery.

A section through the tumor and its pedicle showed a wall about 1 cm. thick consisting of a fine skin, then a layer of cellular tissue and a fibrous membrane, and then another layer of cellular tissue and a fatty whitish tissue about 5 mm. thick. The inner surface of the wall was smooth. The tumor contained about 300 gm. of fluid resembling that of serofibrous pleurisy. Floating in this fluid was a second smaller cyst adherent to the wall of the first sac near the pedicle.

Encephalocele is rare in France but more common in northwestern Europe. French authors regard the occipital type as the most common, but Russian writers give first place to the anterior type. Of 59 collected Russian cases 8 were posterior and 49 anterior. Of a total of 99 European cases 71 were posterior and 28 anterior encephaloceles. The treatment of the two types is different.

Anterior encephaloceles are usually small, grow very slowly, rarely ulcerate, and may develop without causing any trouble until an advanced age. Occipital encephaloceles, on the contrary, are generally pedunculated tumors, always large and sometimes enormous, which grow rapidly after birth and usually ulcerate and cause meningitis. In cases of the latter variety, therefore, early operation is necessary. Raynaud's case was of this type. Operation is always serious, however, and the immediate mortality is high. Shock and meningitis in the first few days and then the gastro-intestinal or bronchopulmonary complications which are so frequent in the new-born are responsible for many deaths. Lyssenkow in 1898 collected 26 cases in which there were 33 recoveries and 29 deaths. Petroff in 1905 reported that the mortality in 145 operations was 45 per cent. Berezngowsky in 1913 reported 199 operations which were followed by 122 recoveries and 77 deaths. The mortality is somewhat less in the occipital than in the anterior type (33.7 per cent occipital; 42 per cent anterior). The postoperative prognosis is also very unfavorable as in the majority of cases hydrocephalus develops or there is mental deficiency. W. A. BRENNAN.

Tieck, G. J. E., and Hunt, H. L.: Plastic and Cosmetic Surgery of the Head, Face, and Neck. *Am. J. Surg.*, 1921, xxxv, 173, 211, 234.

The authors give a very interesting historical review of the subject of plastic and cosmetic surgery of the face, neck, and head and discuss the following methods of treating keloids: (1) excision, (2) X-ray, (3) electrolysis, (4) thiosinamin, (5) injection of formalin, (6) Finsen ray, (7) injection of creosote oil, (8) radium, (9) massage and pressure, and (10) injection of bile. It is their practice to remove skin sutures twenty-four hours after operation to prevent scar formation. They state that they are now experimenting with turtle bile in the prevention and treatment of keloids.

Following an excellent account of the anatomy of the nose and adjacent structures they describe their own operation for saddle nose. They have

found that, as grafts, sections of the ribs, costal cartilages, sternum, and tibia are only mediocre. In over 400 cases they have used the middle turbinate bone for the graft.

After the field has been rendered sterile and anæsthesia has been induced the middle turbinate bone is separated from its insertion with the scissors and removed intact with flat forceps. This part of the operation must be done very gently for if the future transplant is injured or crushed during its removal, it will offer resistance to the re-establishment of circulation and become necrotic. With care not to injure its periosteum the operator clips off all the mucous membrane and shapes its edges with the scissors and then subjects it to thermal sterilization of 143 degrees F. in normal saline solution for four minutes. After this, it is thrown into a bath of a similar solution and washed free of all collagenous material and debris by an assistant while the operator prepares its future bed.

Just within the nose an incision is made running from behind forward, parallel to the line of insertion of the lateral cartilage in the septum. This incision must be no wider than the breadth of the transplant. Through it the operator inserts his knife and with care forms a pocket under the periosteum of the nasal bones and along the edge of the triangular cartilage. The transplant must fit this cavity with comfort and without compression. After its insertion 3 per cent iodine is applied to the edge of the wound and the anterior nares is packed with sterile cotton. Ice compresses are applied over the nose for twenty-four hours.

FREDERICK CHRISTOPHER, M.D.

Neff, J. M.: Arthroplasty of the Jaw; With Some General Remarks on Focal Infection and on the Formation of New Joints. *Surg., Gynec. & Obst.*, 1921, xxxiii, 8.

The author reports a very unusual case and discusses the general problems of arthroplasties and focal infections. His case was unique in the following particulars:

1. The duration of the condition. The ankylosis had been present for seven years, developing during an attack of uræmic coma in the later months of pregnancy. At that time the patient had suppuration in the mouth, presumably around some of the teeth, but she does not know whether or not both sides were involved. Some of the teeth on the left side were extracted so that she could take soft food and on this diet she had existed ever since.

2. The age of the patient. She is now 39 years old. Therefore the ankylosis developed when she was between her thirty-second and thirty-third years.

3. The presence of a persistent and continuous nephritis from the time the condition began. The urine contained a large quantity of albumin, epithelial, granular, and hyalin casts, and many leucocytes. The systolic blood pressure at the time the author first saw the patient was 165 to 170 mm., and the diastolic, 95 to 100 mm.

4. The presence, in association with the nephritis, of a marked infection around the roots of nearly all the teeth.

5. The diminution of albumin in the urine and the decrease in the blood pressure following the removal of the abscessed teeth and the drainage of the pus pockets at the time of operation so that only a trace of albumin and an occasional pus cell and hyaline cast remained.

6. The roentgenograms of the temporomandibular joint which showed the left joint normal, but the articular surface of the condyle on the right side to be irregular and the space obscure though it was impossible to say whether or not there was fibrous ankylosis within the joint.

7. Noticeable retraction of the chin.

8. The impossibility of determining by the most careful examination which side the fixation was on or whether both sides were involved. Examination showed the masseter muscles to be very tense and the anterior edges sharp and firm. It was very certain that the fixation was extra-articular, but before operation nothing more could be said.

Under gas anesthesia a semicircular incision with its convexity upward was made through the skin and subcutaneous fat over the right zygomatic process, and the resulting flap was turned down. The zygomatic process was then exposed by an incision made through the temporal fascia well posterior and in a direction forward and upward to avoid the temporal branches of the facial nerve. The soft tissues were retracted forward and slightly downward after they had been separated from the zygoma with a periosteotome, and $\frac{1}{2}$ in. of the zygoma was resected by means of a Gigli saw, but was not preserved for transplantation. The temporomandibular joint was then carefully exposed. As far as the interior of the joint was concerned, it was found to be normal.

The coronoid process was next exposed and with the insertion of the temporal muscle was resected but no movement of the jaw followed. The tense portion of the masseter muscle was then divided anteriorly. This also gave no result. As is usually necessary in extra-articular fixations, the neck and condyle were resected at a point $\frac{1}{4}$ in. below the base of the condyle. Even when this was done, however, there was no motion in the jaw. The bleeding having been controlled, the same exposure was made on the left side, $\frac{1}{2}$ in. of the zygoma being resected. The left temporomandibular joint was found to be normal. The left coronoid process with the insertion of the temporal muscle was resected without the slightest effect as regards motion. The tense portion of the left masseter muscle also was divided without result.

There then remained but one thing to do, viz., to resect the left condyle within $\frac{1}{4}$ in. of the neck. This having been done, the jaw at once opened to the extent of 1 in. as measured by the distance between the upper and lower incisors. No muscle, fascia, or any other substance was interposed between the

mandibular fossa above and the neck of the condyloid process below. The bleeding on both sides, which was not profuse, was permanently controlled by ligation, and the skin flaps were brought up and approximated with horsehair sutures. A small rubber drain was placed in each wound at the posterior angle and allowed to remain for twenty-four hours. Forty-eight hours after the operation the face was greatly swollen, but this condition had disappeared on the fifth day. The wound healed by primary union and the patient was sitting up on the sixth day. After the swelling had subsided, passive movements of the mandible were painless and normal in degree. The ability to close the mouth has steadily improved.

The author gives a good description of the anatomy concerned and concludes that in every case of ankylosis operated on, whether it is articular or articular-extra-articular, the result must fall very much farther short of normal function than, for example, in the elbow. In Neff's opinion there are only three joints in the body in which arthroplasty is indicated. These are the elbow, the temporomandibular joint, and the tarsometatarsal joint of the great toe. In the last-named it is indicated in cases of bunion.

Traumatism and infection are responsible for the great majority of cases of ankylosis of the jaw, both of the articular and the extra-articular types. In the extra-articular and articular-extra-articular forms infection plays by far the more important part. Infection may occur by direct extension or through the blood stream. The importance of focal infections in the etiology of arthritis the author believes is greatly over-estimated. In regard to the time of operation, he states that surgical intervention should be delayed for six months after the subsidence of the acute condition in order that there may be no danger that it will light up the infection.

With an occasional exception, ankylosis of the temporomandibular and elbow joints constitutes the only indication for arthroplasty. A good result in arthroplasty is dependent upon articular surfaces of small area, very limited gliding motion, and the absence of great pressure within the joint.

Forcible separation of the jaws is worse than useless, and resection of a part of the horizontal portion of the jaw little better.

FREDERICK CHRISTOPHER, M.D.

NECK

Mann, L.: Spastic Torticollis, with Special Reference to Its Operative Treatment (Ueber Torticollis spasticus, insbesondere seine operative Behandlung). *Berl. klin. Wchnschr.*, 1921, lviii, 269.

As the results of neurological treatment are not very good in cases of spastic torticollis, surgical treatment is indicated in all severe cases. It is not only a single muscle that is affected in this disease, but the entire muscle complex. Therefore the site of the spasm must lie in the motor centers of the

brain. Etiologically spastic torticollis belongs in the same class as writers' cramp.

On the basis of his experience in three cases the author recommends the following method:

First, resection of the spinal accessory nerve on the side opposite that to which the head is turned, with section of the sternocleidomastoid and the upper part of the trapezius. If this is not enough, section of the splenius and semispinalis and as many as possible of the deep muscles of the neck on the side toward which the head is turned.

Mann states that it is possible that the spasm may still persist after this procedure but experience has shown that it gradually decreases until it almost, if not entirely, disappears. SIMON (Z).

Mayo, C. H.: The Thyroid. *Med. Rec.*, 1921, c, 177.

The great progress in medicine during the past few decades has come about largely through studies in biology and physiological chemistry, such as the determination of the selective action of digitalis on the heart muscles and of the microbe of poliomyelitis on the anterior horns of the spinal ganglia. Mann has shown that the action of Dakin's solution on the tissues is chemical and that 12 c.cm. for each kilogram of body weight administered intravenously is a lethal dose. Kendall expressed the active constituent of the thyroid gland in chemical terms and enabled Plummer and Boothby to determine the amount of thyroid secretion in the average gland and body, and the length of time the amount in the body will function after the removal of the gland.

Comparatively few cases of goiter in the United States occur in New England or in the Southern States. There were about 3 cases of goiter to each 1,000 draft recruits in the district of New York, 7 to 1,000 in the Great Lakes region, 8 to 1,000 in Montana, and 14 to 1,000 in Oregon, Washington, and Idaho. Body tissue demand for the thyroid hormone is evidently the natural stimulus of gland activity. Possibly the demand is increased by infection.

In Europe a condition resembling exophthalmic goiter had been recognized as pseudo-Graves' disease, or *forme fruste*, but was not clinically distinguished in this country until recognized by Plummer in 1909. Plummer showed that there is a type of long-standing goiter, perhaps of fourteen to twenty years' duration, which is accompanied by hyperthyroidism but not by exophthalmos.

The thyroid gland is protected by a circulation greater than that of any other organ in the body; on the other hand, the lymphatic supply of the thyroid is within it, delivering to its veins and not to lymph ducts. So far as is known, the secretion in the interior of the vesicle can escape only by passing back through the cells which produce it. In exophthalmic goiter there is hypertrophy of the epithelium causing crowding of the vesicles and no retention of secretion. In simple goiter and in the goiter of adolescence an excessive amount of the colloid is retained.

The soft goiters of adolescence respond to treatment with sodium iodide and thyroid extract. Later in life nodular encapsulated adenoma may develop on fetal tissue with colloid, or there may be various degrees of calcareous and fibroid changes; also cystic degeneration which is rarely toxic.

Destruction of the gland due to disease produces hypothyroidism. Goiter rarely destroys the functions of the gland to such a degree that high-grade myxœdema results but thyroiditis does. In their early stages thyroiditis and carcinoma are similar in clinical appearance. Irregular, hard nodules, and enlargement of the adjacent lymphatics suggest malignancy. A small, hard, symmetrical gland not exophthalmic goiter may be tuberculous.

The epinephrin test may produce dangerous reactions in severe cases and in the cases of nervous patients may lead to mistaken conclusions. On the basis of the epinephrin test many psychoneurotic patients would be placed in the group of those with exophthalmic goiter. Failure in diagnosis is almost impossible, however, if the basal metabolic rate is studied in conjunction with the clinical history.

Substernal goiter usually is well encapsulated and can be easily enucleated, especially if the patient cooperates by coughing slightly. In order to secure this advantage of cooperation, the operation must be performed under local anæsthesia.

The X-ray probably has a beneficial effect on the thyroid and has given relief for a period of time. The objections to such treatment, however, are based on the severe scarring in the many cases in which the neck is burned and the danger of complete destruction of the gland in a few cases. Continued experimentation on those who object to operation may yet standardize the method by securing average success and eliminating present defects.

The decrease in the average mortality of exophthalmic goiter is probably due more to early operation than to advances in surgery. A patient with a high basal metabolic rate, + 56 for example, who is improving following a recent exacerbation is a safer risk than a patient with a rate of + 46 who is on the rising wave of an exacerbation.

The author briefly describes the usual operative technique employed in the Mayo Clinic.

Straeuli, A.: Atrophy of a Goiter After Simple Displacement of a Part of It (Ein Beitrag zum Kropfchwund nach reiner Verlagerung eines Kropfteiles). *Beitr. z. klin. Chir.*, 1921, cxxii, 44.

A man, 33 years of age, who was confined in a hospital for the insane on account of dementia præcox, was operated upon to alleviate severe dyspnoea due to goiter. The hyperæmia present was so severe that in spite of a large incision and the formation of a deep notch in the sternocleidomastoid, it was impossible to find and ligate the inferior thyroid artery. Therefore the right lobe, which was causing the pressure, was brought outside

the wound and fixed with sutures. The isthmus was not visible. An area of the right lobe the size of the palm of the hand was not covered with skin. The wound closed by granulation and the dyspnoea soon ceased.

Eight months after the operation only a nodule the size of a small apple was present on the right side and no enlargement could be felt on the left side. The patient showed great activity and again worked voluntarily. At the end of six months, however, his psychic condition grew much worse and he became almost akinetic. The right half of the goiter had grown somewhat larger, and on the left side there was a nodule the size of a hen's egg. Three months later death occurred from influenzal pneumonia.

At postmortem examination of the thyroid broad strips of connective-tissue degeneration were found in the outer zone. Between the strips of connective tissue were numerous dilated blood vessels which gave the goiter the appearance of a cavernous angioma. In other areas the picture varied, showing marked atrophy of the epithelium in some sections, large areas with cells resembling those of rapidly growing thyroid tissue in others, and hyaline degeneration of connective tissue in others.

Straeuli compares this marked atrophy of the goiter after simple luxation with the results of other methods of operation such as thyropexy, exo- and endothyropexy, and thyroidectomy. A similar process is observed in the parts of a goiter left after resection.

Wolff in 1887 pointed out that after unilateral strumectomy the gland decreases to normal in size on the side not operated upon. Numerous other authors have confirmed his findings even though they rejected his theory that atrophy following the removal of one-half of a goiter is due to the congestion caused by the pressure of the trachea on the other half. Von Eiselsberg later accepted this theory.

In all the operations discussed the isthmus is involved. From numerous anatomical studies and injection experiments made by Delorme, Alamartine, and Gruber, it seems that, even when the inferior thyroid artery is ligated, the isthmus plays an important part in the blood supply of the thyroid, serving as an anastomotic bridge. As in most operations (unilateral resection, resection of the isthmus, section or ligation of the isthmus) this bridge is blocked, the atrophy of the goiter might be explained as being due to a decrease in the blood supply. However, no such mechanical explanation is possible when the operation consists merely in changing the position of the goiter. Straeuli believes the cause in these cases is an alteration in the chemistry of the gland.

Jaboulay was an ardent advocate of exothyropexy, claiming that the simple luxation had good results from a functional and biological point of view and caused atrophy of the goiter. However, while a certain degree of atrophy follows this operation almost invariably and may persist for years, recurrence is nevertheless possible.

Straeuli believes that biological rather than nutritional conditions explain this phenomenon. He assumes that in goiter, with the exception of Basedow's disease, the increasing pressure brings about congestion of the iodine-albumin substances or the products of the katabolism of albumin in the thyroid and that when the pressure is removed these substances are liberated in the organism and bring about atrophy of the goiter by causing a change in the psychic functions. The decrease in volume produced by the operation shows histologically a marked atrophy of gland tissue with connective-tissue degeneration. When the atrophy of the epithelium of the goiter has reached such a point that its functional capacity falls to zero, the general condition grows worse because of deficiency or a change in the essential nature of the newly formed cells.

SAXINGER (Z).

Bergstrand, H.: Tumors and Hyperplasia of the Parathyroid Glands (Ueber Tumoren und hyperplastische Zustände der Nebenschilddrüsen.) *Acta med. Scand.*, 1921, liv, 539.

The author gives a detailed histologic description of a case of hyperplasia of the parathyroids combined with degenerative atrophy of the thyroid. From the histologic picture and the fact that all the parathyroids were involved he concludes that this was a case of hyperplasia rather than tumor of the parathyroids, although he states that it is often very difficult to decide between hyperplasia and tumor.

In the literature Bergstrand found a number of cases of tumors which were apparently made up of parathyroid tissue and some of which were in the thyroid gland while others were outside it. The intrathyroid tumors were not connected with any of the diseases usually attributed to the parathyroid glands. Those not in the thyroid were mostly solitary or multiple adenomata of the parathyroids. In some cases it was impossible to decide whether the condition was a tumor or a compensatory hyperplasia. The fact that many of them were combined with osteomalacia would seem to indicate a causal connection between the two conditions. Bergstrand states, however, that such bone diseases have appeared in cases in which there was no visible enlargement of the parathyroids and the microscopic signs of proliferation described were at least very doubtful; also that tumors of the parathyroids have been observed in cases in which there was no osteomalacia or other bone disease.

The author further describes briefly ten cases of parathyroid hyperplasia or tumor associated with nephritis. In this connection he discusses the relation between kidney disease, calcium metabolism, and parathyroid disease but does not come to any definite conclusion.

The article is supplemented with an extensive bibliography and five plates showing the gross and microscopic appearances of parathyroid tumors.

A. G. MORGAN, M.D.

Moure, E. J., and Portmann, G.: The Operative Technique of Total Laryngectomy (De la laryngectomie totale; technique opératoire). *Presse méd.*, Par., 1921, xxix, 561.

If a patient with laryngeal epithelioma is treated early while the tumor is still within the larynx, wide and complete removal of the disease is possible. The condition is that of a cartilaginous box containing the neoplasm within it, and as the walls have not been destroyed the whole laryngeal box and its contents can be removed by a total laryngectomy. However, because of the mutilating character of this operation, partial operations have been substituted for it. Another factor against it was its high mortality. Even as late as 1890 this ranged from 90 to 95 per cent, but as the technique improved it has fallen to 5 per cent and recently has been reduced even lower. Of 31 patients operated upon in the authors' clinic at Bordeaux since 1913 only one died. As practiced at present, the operation is a one-stage procedure. A single flap is made by a lateral incision and the laryngectomy is performed from below upward.

Local and regional anæsthesia is used, the laryngeal, lateral, and posterior regions being infiltrated. During the operation the lower part of the pharynx is injected by the subhyoid route.

A vertical incision is first made from the hyoid bone to the first tracheal ring. At the ends of this incision two transverse incisions are made to a point in line with the opposite edge of the sternum. In this manner a quadrilateral flap is formed and the larynx and its surrounding muscles are well exposed. The subsequent steps of the operation comprise liberation of the larynx in front and laterally, section of the trachea at the lower edge of the cricoid ring, posterior detachment of the larynx until it is held only by the pharyngeal walls on the sides

and the thyro-hyoid membrane in front, section of these upper attachments, transfixation catgut ligation of the pedicles, cleansing of the operative wound, and closure.

The authors state that the formation of the single quadrilateral flap gives excellent light and greatly facilitates the subsequent steps of the operation. In addition it isolates the tracheal orifice of the laryngeal wound which in most cases becomes broken down by secondary infection. When a double flap is made the cutaneous incision is superimposed in the line of œsophageal suture, falls directly on the tracheal breach, and favors disunion. When the vertical incision is at the side of the neck it is less exposed to infection, and union of the flap by first intention to the subjacent structures is favored.

While the majority of French surgeons follow the German method of extirpating the larynx from above downward and open the trachea only at the last moment, the authors believe that the reverse route is better for the following reasons:

1. It is not always possible to avoid opening the air passages before detaching the larynx. For this reason some surgeons place a small cannula in the larynx during the operation to facilitate respiration.

2. The majority of laryngeal tumors demanding a radical operation occupy the arytenoid region. In such cases it is most difficult to effect the detachment by working from above downward and there is danger of leaving some of the tissues infiltrated by the neoplasm. In working from below upward it is easy to follow the plane of laryngo-œsophageal cleavage and thus to keep within healthy tissue.

The one-stage operation avoids the inconvenience of a prior tracheotomy and does not expose the patient to the operative shock and dangers of a double operation.

W. A. BRENNAN.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Wiesmann, E.: The End-Results of Operations for Cancer of the Breast from 1896 to 1916 (Ueber die Endresultate der in den Jahren 1896-1916 operierten Mamma-Carcinome.) *Beitr. z. klin. Chir.*, 1921, cxxii, 181.

The author reviews the results in the cases of 105 women and 1 man operated upon for cancer of the breast during the years 1896 to 1916. Of the 95 women who were married, 11 had had no children. Therefore these cases do not support the theory that pregnancy with its increased physiological demands on the mammary gland tends to produce cancer. Moreover, they do not show that cancer is any more common in women who have borne many children than in those who have had only a few, or that nursing has any special influence on the development of the condition. In 5 instances the carcinoma had been preceded by mastitis, but these cases were so few in number that they prove

nothing. In 12 cases there was a history of preceding trauma, this incidence being in agreement with that reported by other authors. It does not prove anything, however, except that trauma often leads to the discovery of the tumor.

Nothing new is brought out with regard to heredity. In many cases no cause could be determined. The oldest patient was 84 years of age and the youngest 31. The average age was 53.3 years. Almost one-fourth of the patients were between 46 and 50.

The time that had elapsed before the patients came for treatment also varied greatly. Many of the women had noticed a tumor months or years previously. Their reason for not coming for treatment earlier was that they had never experienced any pain. In many cases there was a yellow discharge from the nipple, but this occurs also in some cases of benign tumors.

One side was involved as often as the other. In 33 cases the tumor was in the upper outer quadrant,

in 7 in the lower outer quadrant, in 9 in the upper inner quadrant, and in only 2 cases in the lower inner quadrant. The upper outer quadrant was involved in one-third of the cases. The size and shape of the tumors varied greatly. In some cases the malignant tissue was clearly defined and in others indistinct. In 69 cases the skin was involved but adhesion to the underlying tissues was much more common.

In 27 per cent of the cases the tumor had ulcerated. In 25 cases there were no palpable glands. In 8 cases the presence of such glands could not be determined because the patient was fat. The author states that if the glands are not palpable it does not necessarily mean they are not affected, and that in some cases glands which have not undergone carcinomatous change can be palpated, the condition being merely an inflammatory hyperplasia due to the carcinoma or a previous inflammation. In 11 cases the supraclavicular glands were enlarged, while in 43 they could not be felt. If supraclavicular glands are palpable the prognosis is very unfavorable. Only 1 of these patients lived two years after the operation.

Scirrhus cancer gives a better prognosis than very cellular forms, but this law is being changed by roentgen treatment as cellular medullary cancers are more amenable to roentgentherapy than scirrhus cancers. Scirrhus cancer is the most frequent form. Next most common is carcinoma simplex. In 12 cases the neoplasm was a medullary cancer, and in the rest there were transition and mixed forms. In 66 cases the axillary glands were found to be cancerous.

Roentgen treatment has not yet taken the place of surgical treatment, being used only to supplement the latter either after or before operation. The author does not advise radiotherapy of operable cancer.

An operation was performed in each of the 106 cases even when there was no prospect of permanent cure. The upper muscle layers were removed with the pectoralis fascia according to Heidenhain's method. The rest of the operation depended on the size of the tumor, every effort being made to effect complete removal. In only 35 cases was primary suture of the skin wound possible, and in some of these it was necessary to undermine the edges of the wound and place the skin under great tension.

Of 15 cases which returned because of recurrence in the scar, primary suture had been done in 10. As transplantation by Krause's method did not prove successful, Thiersch transplantation was substituted for it and in recent years has been done immediately after the operation. The axilla was always drained through an opening on the lateral wall of the thorax.

Nothing special is learned from these cases in regard to postoperative treatment. Recovery was for the most part uneventful. A rise in temperature due to absorption was often observed after the operation. This usually occurred on the second day and in uncomplicated cases did not continue for

more than four or five days. In most cases the temperature rose to 38 degrees C. and sometimes higher. Generally even the most severe operations were well borne if they were done quickly and with as little loss of blood as possible.

Roentgen after-treatment has been used in all cases since 1914, but the time has been too short to warrant definite judgment regarding it. Death followed operation in 2 cases (1.85 per cent) and in both was due to heart failure. Three other patients died in the hospital after intervals ranging from thirty-seven days to five and a half months. These were hopeless cases from the first. Seventy-nine patients (73 per cent) were discharged from the hospital as cured, and 24 (22 per cent) were discharged as improved. There were 26 operations for recurrence, among them 6 for a second recurrence. The results of these operations were not very satisfactory, but they lengthened life to a certain extent. Operation for a second recurrence was not successful in any instance.

Twenty-five of the cases were permanently cured. These constituted 23.4 per cent of the total number or 26.3 per cent of the cases remaining after subtraction of those in which the end-results are not known. Fifty-four patients died within the first three years after operation; 16 have survived more than three years. Metastases were most frequent in the liver, lungs, and bones.

In general the author concludes that the chances for permanent cure in cases of cancer of the breast are fairly good if operation is performed early but become less the longer operation is deferred.

BODE (Z).

TRACHEA AND LUNGS

Lambret, O.: The Pulmonary Complications of Operations upon the Stomach (*Recherches sur les complications pulmonaires des opérations sur l'estomac*). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 912.

The frequency of pulmonary complications following gastric operations suggests to Lambret that they may have their origin in the stomach or jejunum. Research has revealed the presence of bacteria, usually the enterococcus, in the stomach and jejunum in certain cases, and when postoperative pulmonary complications develop similar microorganisms can be found in the lung. Lambret has endeavored to forestall the action of such bacteria by means of pre-operative vaccination.

He gave the treatment to 19 carriers of the bacillus proteus and the enterococcus which he detected by means of the skin reaction. Five increasing doses of bacillus proteus or the enterococcus or of both, containing from fifty million to three billion of the organisms, were given. The dosage was spread over ten days and at the end of this period the operation was performed. Four gastro-enterostomies, six posterior gastro-enterostomies with pyloric exclusion, two gastropylorotomies, and seven

stomach resections were done. The series showed four pulmonary complications with one death. The one fatality, however, the author believes was due to an intercurrent cause. In the three other cases of pulmonary complications the symptoms were temporary and very insignificant. In two they lasted only three days, and in one for only one night.

W. A. BRENNAN.

PHARYNX AND ŒSOPHAGUS

Schoening, J.: Pulsion Diverticulum of the Hypopharynx and Its Treatment (Ueber Pulsionsdivertikel des Hypopharynx und ihre Behandlung). *Ztschr. f. Ohrenh.*, 1921, lxxxi, 1.

The author reports 7 cases of hypopharyngeal diverticulum observed at the Giessen Clinic and discusses the theories as to the etiology and diagnosis of such diverticula as they are given in the publications of Starck and Rosenthal. In the diagnosis the usual methods, such as sounding, œsophagoscopy and X-ray examination, are employed. The dangers of œsophagoscopy are slight if a correct technique is used. Schoening discusses also the methods of conservative and operative treatment.

Three of the 7 cases reported were operated upon by von Eicken according to the Goldmann technique (secondary resection) with the usual results—a feverish reaction, a more or less phlegmonous condition, several slight secondary operations, and temporary fistula formation.

The author collected from the literature all cases operated upon by the Goldmann method. A fistula resulted in 65 per cent, but also in cases of primary suture and those in which a previous gastrostomy had been done healing without fistula formation occurred in only a certain percentage. The security of primary suture is uncertain.

The facts regarding all cases operated upon to date which have been reported in the literature are given in tabular form. Of the cases in which a primary resection was done a primary cure was obtained in 31. In 28 there was recovery with fistula formation. Thirty cases were reported merely as cured, no further information being given. Eleven cases were not cured. The cases of secondary resection according to the Goldman method numbered 17. Six were cured without fistula and 9 were cured with fistula formation. Two others were reported merely as cured; no further information being given.

KULENKAMPPF (Z).

Picard, E.: A Case of Œsophago-Tracheal Fistula from a Stricture Due to a Corrosive (Ueber ein Fall von Oesophagus-Trachealfistel infolge von Verätzungsstriktur). *Arch. f. klin. Chir.*, 1921, cxv, 744.

Besides the very rare congenital cases, there are cases of œsophageal-tracheal fistula due to the extension of a carcinoma of the œsophagus to the trachea, to other ulcerative processes such as lues, actinomycosis, tuberculosis of the peri-œsophageal

and peribronchial lymph glands, and to wounds of the œsophagus caused in most instances by the swallowing of a foreign body.

As the patient usually fails rapidly on account of the original cause, the abnormal communication is frequently revealed first at autopsy. It has been the author's fortune to observe such a case during life and to cure it.

By the accidental drinking of lye twelve years previously the patient had acquired a stricture of the œsophagus. Five years later he had empyema on the left side which was ascribed to an attack of influenza and was cured by rib resection. The patient was able to take only liquid food and became accustomed to using bougies himself. When he was seen by the author there was total obstruction of the œsophagus and all food and fluids were immediately rejected. The œsophagoscope and the X-ray revealed the obstruction 23 cm. behind the teeth. Fluids were rejected, not by retching, but by a typical coughing-up. The presence of the œsophago-tracheal fistula was revealed in the X-ray picture by the fact that the right and left bronchial trees were filled with the barium.

As the patient was in a very weak condition a gastric fistula was made and for four weeks the œsophagus was not disturbed. At the end of this time a fine bougie was successfully introduced into the stomach and systematic dilatation was begun. After four weeks the patient was able to take fluid and soft foods without coughing. At the end of seven months a complete cure was demonstrated by the X-ray.

The author states that this fistula was probably due to the forcible use of the bougies which caused an injury above the stricture leading to mediastinitis associated with empyema which eroded the trachea. As food remnants gaining entry into the trachea were immediately coughed up, they did not injure the lung. The systematic use of the bougies following preparatory rest of the œsophagus relieved the stricture and the small fistula became closed spontaneously.

GANGL (Z).

Madlener, M.: Total Reconstruction of the Œsophagus (Ueber totale Œsophagusplastik). *Beitr. z. klin. Chir.*, 1921, cxxii, 299.

Until the present time, total reconstruction of the œsophagus has always been attempted by the anterior thoracic route. The best results have been obtained by a modification of the method of Roux. The inserted portion of intestine is cut short and in its place a tube of skin is inserted. The advantage of this modification lies in the lessened mortality. A disadvantage is its complicated character; it demands repeated operations and a long term of treatment.

The author simplified the procedure by forming the tube of skin and uniting it to the stump of the œsophagus in one operation. Four weeks later, in a second operation, the jejunal loop was resected and the inserted portion of intestine sutured into the stomach and to the skin tube. Six weeks after the

beginning of the plastic procedures water was passed into the stomach through the artificial œsophagus. The three small holes which still remained in the

skin tube were closed in the course of the next six weeks. The artificial œsophagus has excellent function as shown by the X-ray. HAGEMANN (Z).

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Mandl, F.: Herniæ of the Linea Alba and Their Relation to Ulcerous Processes of the Stomach and Duodenum (Die Hernien der Linea alba und ihre Beziehungen zu den ulceroesen Prozessen des Magens und Duodenums). *Arch. f. klin. Chir.*, 1921, CXV, 537.

In the Hohenegg Clinic during the past ten years 605 cases of ulcer of the pylorus or duodenum were operated on. In 2.3 per cent of these there was a hernia of the linea alba. During the same period, 40 operations were performed for hernia of the linea alba, and in 35 per cent of these ulcerous processes of the stomach or duodenum were found.

The etiological factors of such herniæ—congenital weakness or defect of the linea alba, sudden or chronic trauma, predisposition, emaciation, and anomalies in ventral closure of the body—are discussed by the author with many citations from the literature. The symptoms and diagnosis of the condition when it is not associated with ulceration of the gastro-intestinal tract are discussed and illustrated with case histories.

The treatment is purely surgical. The operative procedures are very numerous. In 1909 Denk described 27 different methods. The surgeon should always bear in mind that there may be a small empty hernial sac behind the preperitoneal lipoma. The reports in the literature as to the results vary widely. By some they have been reported as poor, permanent cure of the symptoms having resulted in only a few instances.

Mandl believes that in cases of unsuccessful treatment the gastro-intestinal tract was not examined during the operation and that some other disease was responsible for the persistence of the subjective symptoms. In this connection he discusses 14 cases of hernia of the linea alba in which there were ulcerous changes in the stomach and duodenum. Gastric carcinoma was not found in any instance. He attempted to establish a differential diagnosis between the simple and the complicated cases of hernia of the linea alba, but neither examination of the stomach contents or roentgen examination showed any difference in the digestive disturbances in the cases of hernia alone or of hernia associated with gastric or duodenal ulcer.

In 2 cases the symptoms persisted after the operation for hernia and a second operation showed ulcer of the stomach. Many authors believe that the coexistence of the these conditions is due to chance; others, that the symptoms persisting after herniotomy are neurasthenic manifestations; and still others, that traction of a band of omentum on the

stomach wall may be the cause of the ulcer. Kelling believes that in both conditions there is irritation of the coeliac ganglion which in turn irritates the gastric nerves. The irritation of the ganglion causes a hypersensitiveness of the stomach to digestive processes and reflex disturbances, the blood content of the viscera is changed, and ulcer formation is favored by the resultant anæmia and atony.

In the literature there are many reports of cases of internal hernia combined with ulcer of the stomach. The type of pain in hernia of the linea alba indicates disturbance of the vessels and nerves of the incarcerated portion of the omentum. The possibility that ulcer may be caused by such nerve and vessel injuries as well as by trauma is well known. Moreover, anatomical studies of the stomach have shown that the pyloric part of the stomach has a much poorer blood supply than the rest of the organ and therefore the pyloric region responds to injury more easily by the formation of thrombi. This explains why injuries of the nerves and blood vessels of the compressed omentum in hernia of the linea alba may cause changes in the stomach wall which predispose to ulcer formation.

When operation for hernia is unsuccessful an irritation of the stomach may have been initiated which persists and causes ulcer formation after the operation. Therefore early intervention on the hernia is important in order to prevent the irritation of the gastric nerves. In cases of hernia with marked digestive disturbances the stomach should be thoroughly examined for ulcer during the laparotomy.

JANSSEN (Z).

Oppel, W. A.: Herniæ of the Abdominal Wall (Zur Frage der Hernien und Vorwölbungen der Bauchwand). *Nautschnaja Medizyna*, 1920, iv.

A long monograph on hernia was published in 1911 by Krymoff and in 1914 by Tischoff. Recently renewed interest in this subject has arisen in Russia because the severe emaciation of the Russian people and the difficult labor they have been obliged to perform on account of poverty have made hernia much more frequent and the supply of trusses has given out.

In a discussion of the condition predisposing to the rupture (weakening of the abdominal wall due to preperitoneal lipomata) the author states that hernia develops when the balance between the intra-abdominal pressure and the resistance of the abdominal wall is disturbed. In the analysis of both factors consideration is given to the condition of the vaginal glands, dilatation of the external inguinal ring, the pre-existence of a peritoneal sac, moveability of the peritoneum, traumata, and emaciation.

The question as to whether the herniæ of emaciation are operable or not is answered in the affirmative. The author then discusses the different types of radical operations. Oppel prefers the simplest method, that of Roux. This procedure, which was first recommended in Russia by Gedroitz in 1912, has been employed by Oppel almost exclusively and has given him the best results. Recurrences are not more frequent afterward than after the more complicated methods.

An important part of the Roux operation is the strengthening of the abdominal wall in the inguinal region by suturing the two folds together over the canal.

Oppel warns against using the method of Roux in the treatment of femoral hernia. For these, the Bassini method is best. In this operation also the suturing of the pectineus muscle and fascia to Poupart's ligament forms a fold which closes the hernial opening completely. Such folding or reduplication is of special importance in the treatment of ventral herniæ and may be employed also in the treatment of umbilical herniæ or herniæ of the linea alba. It therefore has a general application as it permits the restoration of a resistant abdominal wall and gives the wall its former elastic tension.

SCHAACK (Z).

Bryan, C. W. G.: Injuries of the Diaphragm: With Special Reference to Abdomino-Thoracic Wounds. *Lancet*, 1921, cci, 1.

Injuries of the diaphragm without an external wound are produced by a stretching and bursting mechanism or the sharp end of a fractured rib. Rupture of the vault is the most common lesion and occurs most frequently in children and adolescents whose thoracic skeletons are elastic and compressible. A tear of the right side is very unusual because the comparatively immobile liver bears the brunt of compression in this region.

The motility and elasticity of the viscera on the left side cause them to act as an air cushion transmitting the force to the stretched diaphragm. The diaphragm is ruptured usually in the posterior part, the opening often extending into the œsophageal opening.

The symptoms of diaphragmatic injury are those of shock, disordered heart action, and dyspnoea. Breathing is almost entirely thoracic, with a catch at the end of inspiration and sometimes a definite hiccup. Painful and repeated cough may occur and the lips are blue. The pulse is rapid and irregular. The shock may cease in about twenty-four hours and diaphragmatic breathing may be restored as a result of the plugging of the tear by the omentum. Hernia of the stomach into the left pleural cavity, usually with omentum and transverse colon, causes vomiting and other signs of obstruction, but no distension. The chest signs resemble those of hydro-pneumothorax. The hernia may reduce itself, recur, become chronic, or cause death from shock and obstruction.

The diagnosis is difficult. The X-ray findings may be fallacious because of difficulty in making the opaque meal enter a supradiaphragmatic pouch.

Lockwood first pointed out in war surgery that the cardiac and respiratory embarrassment from wounds of the diaphragm closely resembles that of open pneumothorax and that the patient's condition is improved as soon as the diaphragm is closed. This consideration makes early operation important.

Rupture of the crus of the diaphragm appears to be an uncommon injury. The author has observed one case with severe respiratory distress and intraperitoneal hæmorrhage. Simple laceration of the diaphragm by a fractured rib usually results from direct violence to the ninth or tenth ribs. The bone may lacerate also the spleen or liver. The symptoms of simple rupture of the diaphragm may easily be overlooked or attributed to shock or hæmorrhage.

Penetrating wounds of the diaphragm carry a very high mortality. In 1915, severe abdomino-thoracic wounds were considered outside the range of surgery. The most serious elements of a wound traversing the diaphragm may be the actual opening, the injury to the thoracic or abdominal organs, or both. The actual opening handicaps circulation and respiration, allows prolapse of the abdominal viscera into the thorax, and enables infection to escape from below to the pleura and in the opposite direction. The thoracic wounds embarrass respiration by causing collapse of the lung, hæmothorax, pneumothorax, and injury to the heart; life may be endangered by hæmorrhage or sepsis. Abdominal lesions cause hæmorrhage, sepsis, obstruction, and metabolic changes such as occur in injuries to the liver.

The diagnosis of injury of the diaphragm in through-and-through wounds can usually be settled by estimating the line the missile has taken. If the missile is retained, its localization by the X-ray and the character of the breathing are the most valuable indications.

The primary objects of early operation in chest wounds are the prevention of sepsis and the closure of an open pleural wound. It is usually impossible to estimate the degree to which the symptoms are due to hæmorrhage, mechanical interference with thoracic viscera, or hernia of abdominal contents. All of these conditions may be corrected by early operation which usually holds out the only hope of recovery.

Operation may be done through an abdominal incision with a separate thoracic incision if necessary for dealing with the intrathoracic injuries. In some cases an incision may be made through the lower chest wall and carried downward and forward into the abdominal wall.

If there is a lower thoracic wound, any injured muscle, bone, and pleura are excised. If the lung is injured, any pieces of metal, bone, or cloth are removed and the contaminated lung tissue is excised and sutured. The pleura is cleansed in mild

cases by swabbing and in severe cases by eusol irrigation.

The diaphragmatic wound is excised and enlarged if necessary. Its edges are then firmly sutured to the intercostal muscles to close the pleural cavity securely. Speed in this part of the operation is important. The abdominal viscera should then be examined and repaired. In certain cases the abdomen is closed with drainage.

Paravertebral nerve blocking with gas-oxygen anaesthesia minimizes the shock of such a severe operation. Transfusion was responsible for many successful results. When given toward the end of the operation, it is less wasteful and perhaps more beneficial than when employed as a preliminary measure as less anaesthetic is needed before the transfusion. Oxygen was given during the operation and for twenty-four hours afterward. Rectal and subcutaneous saline up to 20 pts. in twenty-four hours was given as a routine measure.

The following aspects of diaphragmatic injuries should be borne in mind: (1) the part affected, whether the central tendon, the vaults, or the margin, (2) the direction of the missile, (3) complications of sepsis and hæmorrhage, (4) injuries of the liver, spleen, pancreas, stomach, kidney, colon, jejunum, omentum, or lung, and (5) hernia of abdominal contents into the thorax. Wounds of the central tendon involve the heart and such cases rarely reach the clearing stations.

Contour wounds more or less along the margin of the thorax may cause severe injury to the margin of the diaphragm without injuring the pleura. They respond best to early excision *en masse* and suture of the diaphragm and chest wall. This treatment prevents suppuration and the disability that results from a large scar in this region. Penetrating bullet wounds from the right hypochondrium to the eighth, ninth, or tenth interspaces do not demand operation unless there is unusual bleeding from the liver or fracture of a rib. In the latter type of case the wound should be excised *en masse* and closed tightly.

Shell wounds cause more frequent infection of the pleura, lung, liver, and subphrenic space than bullet wounds, and result in more frequent severe primary hæmorrhages from the liver. Primary operation is recommended for the removal from the liver of all fragments of shell, bone, or cloth.

In all wounds of the liver there is risk of the sudden development of an acute toxæmia with acute collapse, high temperature, and death within a few hours. Passage of the missile into the thorax after penetration of the intestine nearly always causes death.

Penetrating wounds of the left side of the diaphragm cause injury and bleeding from the spleen, mesentery, omentum, stomach, and intestine more often than similar wounds of the right side; they produce hernia of the abdominal contents and also greater cardiac and respiratory embarrassment. Operation on all wounds of the left diaphragm is

indicated because of the frequency of hernia of the omentum.

Renal injury is common and its seriousness depends on hæmorrhage and later perinephric infection. The perinephric space should always be drained early. Packing, and occasionally suture, control the hæmorrhage. The late effects of diaphragmatic injuries include: (1) the results of retention of a foreign body, (2) scarring and adhesions, and (3) diaphragmatic hernia.

A foreign body retained in the diaphragm causes fixed pain which is more severe on lifting, coughing, or deep breathing. The diagnosis is made by means of the X-ray, and if symptoms are severe the foreign body must be removed. Transpleural operation is the method of choice, as it allows freeing of pleural adhesions which often are responsible for many of the symptoms.

Adhesions of the diaphragmatic scar to the chest wall and to the viscera in relation to it seem to cause definite disability. Pain on exertion may be felt in the wound, the lower thorax, the upper abdomen, or beneath the clavicle. The adhesions can be shown by the X-ray.

Diaphragmatic hernia is more common on the left side than has been realized and should be suspected when complaint is made of pain and attacks of vomiting. The symptoms of diaphragmatic hernia usually develop so insidiously after the injury that the time of onset cannot be accurately judged. The most common site of the opening is antero-lateral to the œsophageal orifice. The edges of the hole may be sharp or thinned out and incorporated by adhesions with the surfaces of the prolapsed viscera. Strangulation occurs frequently and is often the occasion for operation.

In chronic cases the most prominent symptoms come from gastric involvement. Pain soon follows the ingestion of food and is relieved by vomiting and at times by lying down; it is made worse by exertion. Pain is located in the epigastrium, the lower abdomen, the affected side of the chest, below the clavicle, or in the shoulder. Vomiting is a prominent sign. Perhaps the most typical single sign is the patient's increased ability to retain ingested fluids when lying down. Constipation is almost invariable. Dyspnœa and pain occur during deep breathing. Objective evidence is often slight, but there may be abnormal flattening of the abdomen, which is usually relaxed, and a feeling of emptiness on palpation of the epigastrium. Local rigidity and tenderness, however, may be present. The stomach resonance may extend above the nipple. The breath sounds are usually faint on the left side and accompanied by gurgling. The left chest may appear fuller than the right, while its movements are usually diminished. The close relation of the stomach to the pericardium often gives persistently rapid heart action which is made worse by exertion and eating. In the chronic stage this condition has been mistaken most often for pyloric obstruction or pneumothorax.

Radioscopy gives the clearest evidence obtainable, although repeated examinations and considerable manœuvring may be required to get the opaque meal into a supradiaphragmatic pouch. The patient must be examined facing the observer squarely and obliquely as well as in the upright and supine positions.

The author concludes that cases of acute obstruction should usually be operated on by the abdominal route. In chronic cases the thoracic method of approach allows division of adhesions under better observation and control than the abdominal method and permits emptying of the stomach pouch before reduction, accurate suturing of the diaphragm, and better cleansing of the pleura.

B. F. EAGER, M.D.

GASTRO-INTESTINAL TRACT

Jean, G.: Surgery of the Gastric Crises of Tabes (Essai sur la chirurgie des crises gastriques du tabes). *Lyon chir.*, 1921, xviii, 339.

Jean refers to surgical operations on the pneumogastric nerve, Foerster's operation on the posterior spinal roots and its modifications, operations on the visceral sympathetic nerves such as Vallas' and Jaboulay's elongation of the solar plexus, and general splanchnic nerve operations.

He deals especially with the splanchnic nerve, which is practically the principal sensory nerve of the stomach anatomically and physiologically, including all the nerve fibers coming from the fifth to the ninth posterior roots and the corresponding thoracic ganglia which supply the stomach. Interruption of the great splanchnic nerve would obviate the failures or recurrences which follow other procedures because in the latter a sufficient number of nerve fibers are not reached.

The lesser splanchnic nerve is anatomically and physiologically the chief nerve of the mesenteric plexus. Jean believes that section of this nerve is to be considered only in cases of mixed gastro-intestinal crisis. The great splanchnic nerve is most easily reached by the transpleural route. The pneumothorax which results is an inconvenience but it is now known that it need not be feared.

The incision is begun immediately beneath the scapular angle and extended along the axis of the eighth rib as far as the anterior axillary line or beyond. It is then made down to the bone and from 12 to 15 cm. of the eighth rib are removed by subperiosteal resection. When respiratory equilibrium is re-established after the pneumothorax the thoracic wound is enlarged with a Tuffier retractor and the parietal pleura is exposed and incised parallel to the vertebral column for 6 to 8 cm. The azygos vein is then dissected and the great and lesser splanchnic nerves are exposed. The great splanchnic is liberated and sectioned between ligatures and the thoracic wound then closed.

The only risk in the entire operation is injury to the azygos vein and this can be avoided by carefully

planning the pleural incision and taking the necessary precautions in stripping the pleura. When the X-ray shows that the pneumothorax is completely resorbed the operation is repeated on the opposite side. Jean believes that it is best to begin on the left side.

There are two types of gastric crises in tabes. One, which is very rare, is due chiefly to disturbances of the pneumogastric nerve. For this condition the operation of Cotte and Latarjet (section of the four branches of the pneumogastric on the anterior surface of the stomach) appears best suited.

The other type, which is the most frequent, is due chiefly to disturbance of the sympathetic nerves and requires spinal ganglionectomy or resection of the great splanchnic nerves. The surgical methods described are indicated when medical methods, including alcohol injection, fail to give relief.

W. A. BRENNAN.

LeNoir, P., Richet, C., and Jacquelin, A.: Operative Indications and Contra-Indications in Gastric Ulcer (Indications et contre-indications opératoires dans l'ulcus de l'estomac). *Presse méd.*, Par., 1921, xxix, 593.

In the authors' opinion the so-called "simple ulcer" of the stomach is only apparently simple as it is not restricted entirely to the stomach but nearly always is reflected in some degree in the liver and later in the kidney. These secondary hepatic and renal lesions are of great importance in the prognosis and should be borne in mind when the indications and contra-indications for operation are considered.

With the exception of urgent operations and operations for ulcer-cancer, the first treatment of stomach ulcer should always be medical. Only those ulcers should be operated upon which remain painful or cause hæmorrhage or stenosis after a considerable period of rest and medical treatment. Other things being equal, the indications for operation should be more definite in cases of ulcer of the lesser curvature than in cases of pyloric ulcer. When the patient's resistance is good, and especially when there is little evidence of hepatic or renal insufficiency, preference should be given to a radical operation, partial gastrectomy or pylorotomy, but if the patient's resistance is doubtful, cauterization or resection done according to Balfour's method or one of its modifications, with or without gastro-enterostomy, is best.

The operative prognosis is grave in cases of even slight renal insufficiency and in cases of marked hepatic insufficiency. That is to say, hepatic or renal insufficiency is either a relative or an absolute contra-indication to operation according to its degree. In such cases anæsthesia should not be induced with chloroform and the operation should be limited to what is strictly necessary. After the operation the patient should be kept under medical supervision for a prolonged period.

W. A. BRENNAN.

Von Bomhard, H.: The Relations of Carcinoma of the Stomach to Gastric Ulcer (Ein Beitrag zu den Beziehungen des Magencarcinoms zum Magengeschwür). *Muenchen. med. Wchnschr.*, 1921, lxxvii, 1471.

That a gastric cancer may develop from an old gastric ulcer has been known for a long time, but undoubtedly the frequency of this occurrence has been overestimated. The various authors who have studied the problem have come to quite different conclusions. Hauser, the pathologist, was the first to demonstrate the development of cancer at the edge of an ulcer. In general it may be stated that the occurrence of ulcer-carcinoma is relatively rare.

According to Konjetzny, who studied the subject extensively, we may assume that a cancer has developed on an ulcer basis only when the pathologic examination demonstrates that the ulcer shows the typical characteristics of a chronic gastric ulcer throughout and its edges and base show only partial cancerous infiltration. As in many cases it is entirely impossible to differentiate a callous ulcer from a carcinoma or to recognize beginning cancerous degeneration in an ulcer at the time of operation, the indications for the resection of ulcers must be considerably extended.

In examining a number of stomachs resected for ulcer the author was able to find only a single case in which a carcinoma developed on an ulcer basis. This case he reports in detail. GANGL (Z).

Novak, E.: Acute Postoperative Dilatation of the Stomach. *J. Am. M. Ass.*, 1921, lxxvii, 81.

The early recognition of acute postoperative dilatation of the stomach is of great importance because of the necessity for early treatment.

Of the numerous theories as to its cause which have been presented in the past, the author considers only two.

The theory of duodenal occlusion originated by Rokitansky in 1863 rests on the supposition that the duodenum is constricted by the weight of the mesenteric vessels. The mechanism by which this weight is augmented is believed to be the drag of the small intestines when they drop into the pelvic cavity and the pressure of an over-distended stomach on the mesenteric root. The author rejects this theory for the following reasons:

1. Duodenal dilatation occurs in only from 25 per cent to 38 per cent of the cases of acute gastric dilatation.

2. In the literature there is only one case in which the obstruction seems to have been sufficiently definite to cause marked obstruction.

3. It would be impossible for duodenal occlusion to cause such sudden dilatation as has been observed in thirteen cases during operation.

4. Reports of high intestinal obstruction present the picture of intestinal obstruction clinically and pathologically, and not the picture of acute gastric dilatation.

5. Childbirth presents an excellent opportunity for the intestines to drop into the pelvic cavity but acute gastric dilatation is rare after childbirth.

6. In the author's two cases observed during operation the patients were in the Trendelenburg position which made it impossible for the intestines to drop into the pelvic cavity.

7. If duodenal occlusion were a factor there would be an almost perfect indication for gastro-enterostomy but as a matter of fact this operation is unsuccessful.

8. If a definite mechanical obstruction were present it would be hard to explain the fact that recovery results in more than 50 per cent of the cases following the use of the stomach tube only.

9. Acute dilatation has followed gastro-enterostomy in a number of instances.

Brinton in 1859 first suggested that acute gastric dilatation may be the result of disturbance of the nerves in the stomach wall with consequent paresis. This theory now has the support of many modern writers on this subject. It assumes that the stomach receives afferent impulses during an operation which cause paresis of its wall, and is supported by the following observations:

1. Experimental section of the vagi causes acute gastric dilatation.

2. Accidental section of the vagus by Hartwell during a difficult thyroidectomy caused acute gastric dilatation.

3. Atony of the bladder with retention is a frequent sequel of perineal operations.

4. Sudden and extreme local dilatation of the uterine wall is observed occasionally during curettage.

5. Simply stroking the abdomen of a pithed frog with the handle of the scalpel causes the heart to stop in diastole.

6. The rapidity with which dilatation occurs during operation as observed in thirteen cases.

Vomiting is the most prominent symptom. It often becomes conspicuous soon after operation and is commonly mistaken for postanæsthetic emesis. In some cases, however, it may not occur until many days after the operation. It is characteristically of the regurgitant type with little retching or straining. It gives little or no relief, appearing to be only an overflow. The amount vomited may be small or very large.

Pain is almost always present but its severity varies greatly.

Collapse is noted in practically all severe cases and is in proportion to the vomiting and fluid loss. It is associated with great thirst and suppression of urine.

Distention of the abdomen is very characteristic. The enlargement occupies chiefly the left side of the abdomen. In milder cases it is principally above the umbilicus but in severe cases extends below it.

When associated with typical abdominal distention the symptoms enumerated should always suggest gastric dilatation. The introduction of the stomach

tube is followed by the escape of large amounts of gas and fluid. Immediate collapse of the abdominal distention clinches the diagnosis.

Peritonitis and intestinal obstruction must be differentiated. In both of these conditions the abdominal distention is more diffuse and rounded and is not appreciably reduced by lavage. Peritonitis is characterized also by fever, leucocytosis, tenderness, and rigidity, and acute ileus by tenderness, rigidity, and more severe pain.

Thirteen cases, two of which were the author's, have been observed during operation. In these instances the rapidity of the dilatation was the most characteristic feature. All of the patients except one were relieved by the prompt passage of the stomach tube.

All postoperative cases with more than the usual emesis should receive gastric lavage.

When dilatation has developed, prompt and repeated gastric lavage must be carried out. In extreme cases the patient should be placed in the knee-chest position to facilitate the complete evacuation of the stomach.

Postural treatment, the patient being placed in the prone position, has been used on the theory that there is duodenal occlusion.

Gastric lavage has reduced the mortality to less than 50 per cent.

J. J. LEBOWITZ, M.D.

Mayo, C. H.: Carcinoma Developing on Gastric Ulcer. *J. Am. M. Ass.*, 1921, lxxvii, 177.

The greatest number of cancers occur in the areas of the body that are normally acid. Thus it is that probably one-third of the cancers affecting men, and more than one-fifth of those affecting women, are found in the stomach, the organ of highest acidity, and many more cancers occur in the large bowel than in the alkaline small bowel.

Cancer of the stomach is confined to that organ in approximately 20 per cent of cases until death results from obstruction, perforation, and peritonitis. This group of cases includes those in which good results are obtained from operation.

Clinical observations show that previously traumatized epithelial areas are much more susceptible to the development of cancer than normal epithelial areas.

Insofar as cancer (a migratory hyperplasia) is concerned, the author's observations have revealed a biologic reaction which is malignant only insofar as it destroys the communistic organization of cells. He believes a biologic cause of cancer is exhaustion of epithelial areas induced by age, chronic traumatism, or irritation, and that an activating agent would be the environment, such as an acid, especially butyric acid. The three fundamental biologic reactions to destruction (hypertrophy, hyperplasia, migration) occur in various tissues of the body. The reactionary cells of these conditions are apparently normal structurally, but in their relation to the communistic organization of cells they are abnormal.

The exact starting point of gastric cancer is unknown, but the early cancers which have been observed have been found in the mucosa in the borders of chronic ulcers.

There are simple chronic gastric ulcers without any signs of cancer, and also similar ulcers in which the normal columnar cells of the gastric tubules are partially or completely replaced by spheroidal or ovoidal undifferentiated cells which are intra-tubular. In addition there are similar ulcers in which the ovoidal or spheroidal cells are extra-tubular, hence in the stroma (MacCarty).

Williams states that 60 per cent of cancers of the stomach occur at the pylorus where only 12 per cent of ulcers occur. This shows the greater influence of trauma on fewer ulcers in the more active areas of the stomach.

Cancer rarely occurs in the duodenum. In the few cases in which it does occur in this region it arises as a rule in an adenoma or a duct entrance, rarely in ulcer.

In order to emphasize the greater danger from gastric ulcer as compared with duodenal ulcer, the data from Hunter's report are summarized:

The results of 2,431 consecutive gastro-enterostomies performed at the Mayo Clinic were studied. All but 108 patients were traced, 22 of whom had ulcers of the stomach. Five hundred and twenty-one patients with gastric ulcer were under observation on an average for 3.6 years. The mortality was 17 per cent. The first year it was four and one-third times the death rate in a like group in the general population. The rate diminished during the remainder of the period. One thousand, six hundred and fifty-one patients with duodenal ulcer were observed for 3.4 years; the mortality was 5 per cent, which is approximately that of the general population of the same age. Gastric ulcer occurs less frequently but is more serious.

In 1919 and 1920, at the Mayo Clinic, a diagnosis of cancer of the stomach was made in 1,529 cases; in 54 per cent the condition was considered inoperable because of the extent of the disease, metastasis, complications, etc.

It will take years of observation to estimate fairly accurately the percentages of cancers which have occurred in ulcers, even if from 1 in 12 to 1 in 6 are thus developed. The author believes the percentage is higher.

Data show that several general factors contribute to the causation of cancer, namely, irritation, partial destruction, and environment.

In gastric cancer some degree of protection can be given if the disease is recognized early and relieved.

Hempel, E.: Retrograde Incarceration of the Entire Small Intestine with the Lauenstein Traction Arch (Retrograde Darminkarzeration des ganzen Duendarms mit Lauensteinscher Zugarkade). *Deutsche Ztschr. f. Chir.*, 1921, clxiii, 119.

By the term "retrograde intestinal incarceration" is understood a hernia in which, at operation,

the sac is found to contain two practically normal loops of small intestine while the loops connecting them lie outside the sac in the abdominal cavity and show more or less marked change due to disturbance in their nutrition. About 83 such cases have been reported to date.

There is much disagreement regarding the mechanical cause of this incarceration but especially regarding the cause of the nutritional disturbances in the free loops. Heller's suggestion that this can be determined only by means of carefully taken histories (especially as regards attempts at lifting) and operative findings (regarding the position of the mesentery before the incarcerating ring is cut) is therefore justified.

The author made note of these points in the case of a woman 56 years of age who had had a femoral hernia for twenty years which for several years was the size of two fists and irreducible. Twelve days before she was seen by Hempel she had an attack of gastric pain and vomiting. On the day of operation she had a sudden pain in the region of the hernia which in a few hours increased to the size of a child's head.

At operation on the hernia, which hung down as far as the middle of the thigh, the cæcum, which was the size of 3 fists, was found adherent in the sac. With the cæcum was a strip of the lower part of the small intestine about 20 cm. long which showed a sharp but intact stricturing ridge. In the median angle of the hernial orifice was a second loop of intestine 20 cm. long which was not as congested as the first loop. One end of the latter led to the plica duodeno-jejunalis. The hernial orifice was so narrow that the finger tip could scarcely penetrate it where the intestinal loops passed through. The mesentery of the connecting intestinal loops was not included in the stricturing orifice but lay within the abdomen. Its veins were congested and it showed hæmorrhagic infarcts. The hyperæmia ended in a curved line convex toward the root of the mesentery. The herniated intestine was replaced with some difficulty and the patient made a normal recovery.

After reviewing the various theories regarding hernial incarceration the author accepts the view of Lauenstein who claims that the herniated intestinal loops pull downward on the mesentery of the connecting loops outside the hernia while the greatly inflated connecting loops pull upward, and that in this way an arching and bulging of the mesentery occur which are responsible for the vascular congestion and the formation of infarcts.

KEMPF (Z).

Sawyer, C. F.: Acute Partial Enterocoele. *Surg., Gynec. & Obst.*, 1921, xxxiii, 38.

The author defines partial enterocoele as an abdominal hernia in which only a part of the circumference of an intestine projects as a diverticulum through a hernial opening, reducing but not com-

pletely obliterating the lumen. He reports three cases, reviews the literature, and endeavors to clear up some of the present confusion in the nomenclature.

"Littre's hernia" is a hernia of Meckel's diverticulum. This term therefore should not be applied to partial enterocoele known as "Richter's hernia."

Partial enterocoele occurs more often in women than men and in adults than children. It is frequently femoral and occurs in old herniæ which have been reducible. Stahl's theory of its formation based on his operative experience is that it is due to irregular action of the muscle of the gut wall.

The ileum is the part usually caught, that portion farthest from mesenteric attachment being involved. The omentum and mesentery are rarely confined. The varying obstruction and condition of the bowel wall result in a diversity of symptoms, some cases presenting those of typical strangulated hernia, and others less severe symptoms which are often misleading. The pain may be sudden, sharp, and located in the region of the hernia, or diffuse and without localization. Vomiting which has little relation to the constipation usually occurs but is less severe than in strangulation. There may be diarrhoea or complete stasis. Meteorism is rare as the partial obliteration allows the escape of gas.

The prognosis is unfavorable because the diagnosis is made late and gangrene of the gut develops early.

The treatment is operation at the earliest possible moment. The author recommends the invagination operation of Jones, i.e. turning the strangulated bud back into the lumen of bowel.

C. CORBIN YANCEY, M.D.

Strauss, H.: The Indications for Operation in Colitis Gravis (Chirurgische Indikationsstellung bei Colitis gravis). *Jahresb. f. aenzl. Fortbild.*, 1921, xii, 18.

Besides the very severe colonic inflammations in which surgery is indicated there are less severe cases which resist long-continued medical treatment. In severe cases operation is not very promising. The possible surgical methods are: (1) the formation of a artificial anus, a method used formerly in Germany but little employed by Strauss because patients with colitis have little resistance to any severe abdominal operation; (2) appendicostomy; and (3) the formation of a cæcal fistula, which should be done only when an appendicostomy is impossible. The operation of choice is appendicostomy.

Correct technique in the intestinal lavage after the fistula formation is essential. The author uses physiological salt solution or camomile tea at body heat for a period of one-half to one hour. The fistula is kept open until examination of the fluid withdrawn demonstrates the absence of pus and blood. Such a successful result may be obtained after a few months in some cases, but in others not until after a period of years.

KALB (Z).

Tritto, G.: A Case of Total Atresia of the Colon and Its Surgical Treatment (Un caso di atresia totale del colon e suo trattamento chirurgico). *Rassegna internaz. di clin. e terap.*, 1921, ii, 236.

The author reports the case of a new-born infant which passed no meconium. Examination by rectum showed that there was no obstruction below the sigmoid colon. Immediate operation was advised, the formation of an artificial anus being recommended. As the child's parents would not consent to this procedure a radical operation was done. When the abdomen was opened by a median incision the small intestine was found enormously distended as far as the cæcum. The ascending, transverse, and descending colons were represented by only a very thin cord, but at the sigmoid the bowel resumed its normal size. A loop of the small intestine was anastomosed side-to-side to the sigmoid colon and the abdomen closed. Some hours later patency of the anastomosis was demonstrated by the passage of meconium. The child's condition, however, remained grave and death occurred forty-eight hours later. There was no sign of peritonitis.

Cases of total atresia of the colon are extremely rare. The author has been unable to find any similar case in the literature to which he has access.

Tritto believes that in the treatment of this condition the operation of choice is the formation of an artificial anus as this procedure is more apt to be well borne by a patient whose general condition is poor. The anus should be made in one of the loops of the small intestine as near as possible to the cæcum.

W. A. BRENNAN.

DeMartel, T.: Closure of Stumps Resulting from Section of the Large or Small Intestines (La fermeture des moignons résultant de la section de l'intestin gros ou grêle). *Presse méd.*, Par., 1921, xxix, 653.

In a series of articles to appear the author plans to consider the various defective points in the operative technique of gastric and intestinal surgery as he sees them. This article, the first of the series, deals particularly with the closure of the duodenal stump following gastrectomy.

In DeMartel's opinion the closure of the duodenal stump is the most important step in gastrectomy. Many operative deaths have been due to post-operative complications directly attributable to faulty technique in this procedure. In such instances autopsy has shown that the cause of death was acute generalized peritonitis, localized peritonitis, bronchopneumonia, or a duodenal fistula. Following the use of the classic operative procedure the author has found at autopsy that the closing suture had become septic and a localized abscess had formed. In some instances the abscess had invaded the intestinal lumen.

The technique of closing the intestinal stumps which is proposed by DeMartel and which has given him uniformly successful results is as follows:

The duodenum is sectioned between two Kocher forceps, tincture of iodine is applied to the edges of the divided intestine, and a non-cutting suture is introduced across each surface of the intestine about 1½ cm. from the cut edges. The ends of the two sutures are tied loosely on each side and forceps are applied to the crushed edges of the intestine to hold them together.

The cut end of the intestine is then invaginated and the sutures are drawn tight in the manner of a pursestring. A sero-serous suture completes the procedure.

This technique leaves no pocket for the development of a localized septic process.

LOYAL E. DAVIS, M.D.

Stiles, H.: The Value of Cæcostomy in the Treatment of Malignant Disease of the Colon. *Brit. J. Surg.*, 1921, ix, 1.

The author calls attention to the lack of uniformity in the methods of dealing with malignant disease of the colon. He divides the cases into those in which the disease is diagnosed before complete obstruction has occurred and those in which obstruction has already developed.

For cases of complete obstruction he advises a cæcostomy and the introduction of a small Paul tube. He cautions against pulling the entire cæcum out of the wound and against introducing the hand into the wound for purposes of exploration in the acute cases. Most of the desired information can be obtained by roentgenography.

For cases in which obstruction is absent the two-stage or Mikulicz operation and the one-stage operation are possible. While the former may be safer, it is certainly a more trying ordeal for the patient and not always a simple procedure. For the past ten years it has been the invariable practice of the author to do a primary resection followed by end-to-end anastomosis, and then, as a final step, to make a small incision over the cæcum and stitch the circumference of an area of the anterior cæcal wall about the size of a half dollar (two shilling piece) to the parietal peritoneum and the two deeper muscles by a carefully applied continuous suture. He then opens the cæcum twenty-four to forty-eight hours later and introduces a tube about the diameter of a lead pencil to keep the opening patent. This opening, by providing for the escape of flatus, acts as a safety valve to prevent strain on the intestinal sutures.

In Stiles' opinion a small cæcostomy opening combined with a primary resection permits an end-to-end union with safety and this makes it easier to effect a more extensive removal of bowel, mesentery, and glands than if it were intended to re-establish continuity by a lateral anastomosis. Moreover, it is sometimes possible to effect an end-to-end union in cases in which a lateral anastomosis would be impracticable, such, for example, as when the tumor is situated near the pelvic rectal juncture.

FREDERICK CHRISTOPHER, M.D.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Soresi, A. L.: Reconstruction of the Hepatic Duct.
Internat. J. Gastro-Enterol., 1921, i, 75.

The author states that there have been numerous cases in which, after repeated operations for drainage of the biliary ducts, removal of the gall-bladder, the dissection of adhesions, gastro-enterostomy, gastrectomy, removal of the appendix, etc., the patient continued to complain of pain and ultimately died because the drainage of bile into the intestine was not sufficient. Two cases in particular interested Soresi and suggested to him the possibility of reconstructing a permanent, unobstructable passageway through which the bile would flow into the duodenum when the natural channels had been destroyed or rendered impervious by disease or other cause.

Before undertaking his experiment he had to devise a temporary artificial passageway for the bile which would not leak, and to discover suitable material for the construction of the new permanent organic channel. For the former he used a rubber tube and for the latter a loop of jejunum. He states that if a loop of jejunum is not available the stomach may be resected beyond the pylorus. The mode of operation is as follows:

An ample transverse incision is made, the organ is freed from adhesions, and the tissues are divided between two ligatures to prevent bleeding. A small silver tube is inserted into the stump of the hepatic duct and tied with strong silk. To this is tied a long rubber tube.

The next step consists in obtaining a piece of jejunum. To this end the omentum is raised and the jejunum corresponding to the first few centimeters of the duodenum is well exposed. A loop of jejunum is picked up, the mesentery of which corresponds exactly to the first portion of the duodenum and the blood vessels of which will allow a free blood supply to the piece of intestine to be carried up against the liver. The jejunum is resected and, remaining attached to its mesentery, is wrapped in warm wet gauze. The continuity of the gut is then immediately re-established by an oblique anastomosis.

The jejunum is passed through the mesocolon and between the duodenum and the pancreas. In order to prevent tension and torsion its mesentery is secured to the posterior peritoneum and to the pancreas with a few catgut stitches. The gap in the mesocolon is also closed. The piece of intestine is so arranged that one end comes in contact with the under surface of the liver and the other with the duodenum without causing any tension of the mesentery. The cut edge that will come in contact with the liver is inverted and sutured all around with iodized catgut. The rubber tube attached to the hepatic duct is passed through the jejunum which is then brought into contact with the liver as closely as possible and held there by one or more stitches.

The other end of the jejunum is then anastomosed to the duodenum very rapidly through a small incision with one row of special mattress sutures.

In this manner a temporary passageway is provided for the bile which will immediately flow without leakage into the duodenum through the rubber tube securely tied to the hepatic duct. In the meantime the jejunum will form strong and firm adhesions with the liver above and the duodenum below, the adhesions above being favored and hastened by the iodine present in the iodized catgut. After several days the hepatic duct tied on the silver tube is cut through by the pressure exercised by the silk thread, and the silver and rubber tubes are released. The bile is then able to pass safely through the grafted loop of intestine which will allow its free passage directly from the liver into the duodenum.

GEORGE E. BEILBY, M.D.

Judd, E. S.: The Relation of the Liver and the Pancreas to Infection of the Gall-Bladder.
J. Am. M. Ass., 1921, lxxvii, 197.

Cholecystitis is nearly always associated with some degree of inflammation of the liver or pancreas or of both. Study of the lymphatics of the liver and gall-bladder has demonstrated a very close relationship between them; the lymphatics of the gall-bladder and pancreas also anastomose. It has been suggested, therefore, that in associated conditions of these organs infection is carried in the lymphatics. Some observers, however, believe that the infection is transmitted through the ducts and others that it is carried through the venous system.

In a study of the secretory pressure of the bile, Mann found that the pressure of the bile in the common duct is dependent on three factors, the secretory pressure of the liver, the contractile pressure of the gall-bladder, and the mechanical pressure of the diaphragm and abdominal muscles. This last is greatest during vomiting, and when all the factors are combined a maximum pressure of about 1,000 mm. of bile is reached. The secretory pressure of the liver is equal to about 350 mm. of bile. Many observers have shown that bile injected with a syringe into the pancreatic duct produces pancreatitis. This is probably due to trauma caused by injection under too great pressure for it does not occur if the pressure of injection does not exceed 500 mm. of bile and is rare even when the pressure is raised to 1,000 mm. of bile. A physiological mechanism which can inject bile into the pancreatic duct with sufficient force to produce pancreatitis is exceptional. Also it is seldom that an anatomical arrangement, either through the formation of stone or the action of the sphincter, can convert the duct into a continuous passageway permitting the bile to flow from the common duct into the pancreatic duct. Pancreatitis may occur from this cause but is rare. It is more probable that the infection passes by way of the lymph channels.

A review of 1,290 cases of gall-bladder disease in which operations had been performed at the Mayo Clinic during 1919 revealed little evidence of associated pancreatitis or hepatitis in the subjective history. Forty-seven cases showed hepatitis; 31, advanced cirrhosis; and 347 (26.8 per cent), associated pancreatitis. G. S. FOULDS, M.B.

Hotz, G.: Drainage in Carcinoma of the Biliary Passages (Drainage beim Carcinom der Gallengaenge). *Zentralbl. f. Chir.*, 1921, xlviii, 959.

Hotz recommends the reconstruction method of Verhoogen and Wilms for cases of carcinoma of the biliary passages. The site of the carcinomatous stricture having been definitely determined, the common duct is liberated from the stenosis toward the duodenum and incised. The stricture is dilated with urethral bougies, and a thin but stiff rubber tube, about the thickness of a lead pencil and 12 cm. long, is inserted in the common duct opening, one end being led through the stricture into the upper hepatic duct and the other pushed into the common duct toward the duodenum. The common duct is then sutured over the rubber tube and the gall-bladder is removed or a cystostomy is done. The buried drain remains in place permanently and drains the bile satisfactorily. BODE (Z).

Heyd, C. G.: Cholecystogastrostomy and the Courvoisier Gall-Bladder. *J. Am. M. Ass.*, 1921, lxxvii, 339.

The rapid loss of weight, the emaciation and asthenia, and the pruritus and disturbing mental depression associated with chronic obstructive jaundice very often render attempts at operative relief imperative. In this connection the author recommends the more extensive employment of cholecystogastrostomy. In discussing the physiological function of bile he states that chronic jaundice is uniformly associated with wasting because of difficulty in the absorption of fat. The bile salts which enter the bowel are re-absorbed and used over again several times. Soon after a cholecystostomy has been established, the salts in the bile fall to one-tenth normal as re-absorption cannot occur. The loss of bile externally by prolonged cholecystostomy means exhaustion of bile salts due to failure of re-absorption and a progressively diminishing function of the liver.

Courvoisier came to the conclusion that in cases of chronic jaundice due to obstruction of the common duct contraction of the gall-bladder signifies that the obstruction is due to stone while its dilatation indicates that the obstruction is due to causes other than stone. The exceptions to this law are few.

The technical difficulties of cholecystoduodenostomy with a fixed duodenum and the possibility of duodenal fistula are factors which will prevent the acceptance of this type of anastomosis as a standard surgical procedure. Moreover, its mortality is certainly greater than that of cholecystogastrostomy.

Technically the union of the gall-bladder and the stomach is more easily effected than any other form of anastomosis as the parts are normally in close and intimate relationship and little if any mobilization is necessary to bring them into apposition. The advantages of this type of union are summarized thus:

1. A close anatomical apposition of the two viscera is easily produced.
2. Bile is delivered into the gastro-intestinal tract at an approximately normal point.
3. Visceral mobilization and the technique of operation are easy because the anastomosis is between two viscera of fairly well-developed size and thickness.
4. The sterilizing mechanism of the stomach prevents ascending infection.
5. The mortality is minimal.

In an experimental study by Grey in which cholecystogastrostomy was performed with complete division of the common duct it was demonstrated that on a diet of meat and water with bile constantly present in the stomach throughout the course of digestion there is no appreciable effect on the acidity of the gastric content. Postmortem examination showed a functioning union and absence of pathologic changes in the gastric mucosa.

Cholecystogastrostomy should be performed only when the gall-bladder has a patulous cystic duct with relatively normal walls and is not too seriously diseased. Otherwise the gall-bladder and cystic duct may not function properly as a delivery tube from the common hepatic duct to the stomach. After union of the gall-bladder to the stomach the gall-bladder probably contracts and elongates into a small tubular channel. Roentgen-ray studies following cholecystogastrostomy have shown that bismuth and barium do not enter the gall-bladder. The determination of the gastric acidity after cholecystogastrostomy shows that the amount of free acid is not less than the normal amount although the total acidity varies.

FREDERICK CHRISTOPHER, M.D.

Walzel, P.: So-Called Gall-Bladder Regeneration After Cholecystectomy (Zur Frage der sogenannten Gallenblasenregeneration nach Cholecystektomie). *Arch. f. klin. Chir.*, 1921, cxv, 1000.

Walzel reports three cases in which, eighteen, twenty, and seventeen months after a first operation for the removal of the gall-bladder, a second operation was performed. The first operation was performed in one case for cholelithiasis, in another for acute cholecystitis, and in the third for chronic cholecystitis. The operative records showed that a large part of the cystic duct, and perhaps also parts of the neck of the gall-bladder, had been left behind.

In Cases 1 and 2 the second operation was indicated by colicky pains. The first patient died from pulmonary embolism and the second from peritonitis due to faulty drainage. In all three cases on re-

operation a ball-like formation was found which, in Cases 1 and 2, contained bile and was connected with the enlarged bile ducts, but in the third case ended blindly at the common duct. In Cases 1 and 3 longitudinal section revealed a single smooth-walled cavity, and in Case 2, a system of four cavities which communicated with each other. The sac was everywhere formed by extension and enlargement of the gall-bladder neck; there was no indication whatever of regeneration either in the mucosa or the other coats of the wall. In Case 2 a bilirubin stone the size of a grain of rice was found.

Walzel is convinced that these formations were due merely to stretching of the wall of the stump in all its layers which, as a rule, occurred in the region of the first part of Heister's valve. The cause of this passive stretching was probably injury of the gall-bladder due to ligation and crushing, stagnation in the common duct, adhesions in the vicinity of the duodenum, and spasm of the sphincter of the papilla. As calculi may be formed in such enlargements and as occasionally symptoms of a colicky nature may develop, extirpation is indicated.

NORDMANN (Z).

Soson-Jaroschewitsch, A. J.: The Operative Approach to the Spleen (Die operativen Zugaenge zur Milz). *Nautschnaja Medyzina*, 1920, 4.

Surgery of the spleen has been neglected and to date various methods and incisions have been used although the spleen possesses a number of topographical peculiarities which should be taken into consideration in its operative treatment.

The position of the spleen in relation to the skeleton is not constant. Examination of cross-sections of frozen cadavers shows two chief positions, a higher and a lower. By most surgeons the higher position is considered to be normal (Picon, Testut), but according to the author's investigation it is merely a variant. The projection zone of such a high spleen is not lower than the eleventh rib. Therefore the upper edge is always higher than the tenth rib and frequently extends upward as far as the eighth rib. In the other variant of position the projection zone lies between the eleventh and twelfth ribs and does not extend upward beyond the tenth rib. In the high position the axis of the spleen is more horizontal, while in the low position it is more vertical. The topography of the spleen varies also according to the fullness of the neighboring parts, the stomach, colon, and pleural cavities. A retroperitoneal situation of the spleen is rare but the author discovered three positive cases of this type in the literature.

In studying the numerous incisions for approaching the spleen the author found twenty-eight. These may be grouped as follows: (1) simple laparotomy incisions (23); (2) thoracalaparotomy incision; and (3) the transdiaphragmatic laparotomy incision. The simple laparotomy incisions include the external rectus incision, which, on account of the trauma incident thereto and the poor exposure it affords, is not to be recommended. The entire

incision is lower than the spleen and further exposure injures the costal arch. Incisions along the border of the ribs are better, as are also the modifications of the laparotomy incisions in which an oblique incision toward the left is made in addition. These incisions are indicated especially in cases of enlargement of the spleen. Better approach is offered by resection or bending of the cartilaginous costal arch (Canniot, Lejars, Djakonoff-Marwedel). These methods produce considerable trauma but give the best exposure even when the spleen is not enlarged.

In thoracalaparotomy the incision is made along the upper edge of the ninth rib and the outer edge of the rectus muscle. The diaphragm is divided in the direction of its fibers. This incision is indicated in injuries of the spleen complicated by injuries of the pleural cavity. The exposure obtained is excellent.

The transdiaphragmatic laparotomy incision is of two types, the transpleural and the extrapleural. These give a good approach and are indicated especially in stab wounds of the spleen. In abscess of the spleen, echinococcus cyst, and all other cases in which drainage is indicated, extrapleural incisions are desirable. According to this method the incision is made in the tenth intercostal space and, if necessary, the tenth and eleventh ribs are resected.

SCHACK (Z).

Mayo, W. J.: Splenectomy in Splenic Anæmia and Banti's Disease. *J. Am. M. Ass.*, 1921, LXXVII, 34.

Splenic anæmia is characterized by an enlarged adherent spleen, a secondary type of anæmia, and leukopænia. The etiology of splenic anæmia is unknown or, it may be said, if the cause is known, the condition is not called splenic anæmia, but is considered part of the disease of which it is one manifestation.

While splenic anæmia has quiescent periods, it eventually terminates in death, often from an intercurrent malady which the condition invites. The anæmia is subject to considerable variation. When extreme, it is usually the result of intercurrent gastric hæmorrhages. Leukopænia is a rather constant feature; the white cell count is usually well under 5,000, the average being 3,500, although occasionally it is much higher. Pathologically the spleen shows generalized fibrosis and thrombophlebitis with atrophy of the pulp cells. Most observers are now of the opinion that Banti's disease is merely a late stage of splenic anæmia. The evidence at hand leads to the belief that both the anæmia and the terminal cirrhosis of the liver are due to the pathologic condition of the spleen rather than to toxic material supposedly removed from the blood, and that the exciting cause of the splenomegaly may have little to do with the changes in the blood and liver.

The spleen may be enlarged in cases of hepatic cirrhosis, especially in the mixed forms. There are many cirrhotic pictures but fundamentally there are but two hepatic cirrhoses:

1. Portal cirrhosis, in which the toxic material reaches the liver by way of the portal vein and the connective tissue is deposited around its radicles. Death is caused by obstruction of the portal circulation, ascites, gastric hæmorrhage, etc.

2. Biliary cirrhosis, caused by infection of the biliary ducts, in which the connective tissue is deposited around the ducts and causes jaundice, but without ascites or hæmorrhage until shortly before death.

In portal cirrhosis the spleen may play a prominent part in the etiology, and splenectomy in properly selected cases may be of great benefit. By splenectomy not only is the possible supply of toxic material from the general circulation cut off, but, as has been pointed out previously, the portal stream is reduced also by subtraction of the amount of blood poured into the portal vein from the spleen, about 25 per cent of the total under normal conditions. After the removal of some of these huge spleens an enormous reduction of the portal circulation takes place so that the hepatic cells may be relieved of a sufficient overload to enable them to function normally. In 11 cases of greatly enlarged spleen in which splenectomy was performed for portal cirrhosis encouraging results were obtained.

Splenectomy was performed in 6 cases of primary biliary cirrhosis in adults with great enlargement of the spleen. In these, the cause of the biliary infection so far as could be determined, such as gall-stones, focal infection, etc., was removed previously without marked relief. Of the 5 patients who recovered from the splenectomy all were greatly benefited.

Up to January 1, 1921, 249 spleens were removed in the Mayo Clinic for all causes. The mortality was 10 per cent. Seventy-one splenectomies were for splenic anæmia of unknown origin. In these cases there were 9 deaths. In addition, the operation was performed in 38 cases for splenic anæmias of known origin. These 38 cases deserve some attention.

Chronic sepsis. Eleven spleens which had become greatly enlarged in the course of chronic general sepsis following septic arthritis, tonsillitis, phlebitis, and osteomyelitis were removed. There were 3 deaths in the hospital. The other patients were cured or greatly benefited.

Syphilis. Splenomegaly is often found with chronic syphilis, particularly in the cases in which thorough treatment fails to maintain a negative Wassermann reaction. The spleen was removed in 6 cases of this kind, with 1 death in the hospital. Patients who had resisted thorough syphilitic treatment and in whom chronic anæmia was a manifest sign were at once made amenable to treatment and quickly recovered.

Splenic anæmia in children and von Jaksch's disease. Von Jaksch has described an enlargement of the spleen in infants due to malnutrition which usually disappears when proper feeding is instituted. Some of these patients, however, do not get well and the enlarged spleen and chronic anæmia

are carried into early childhood. Eight spleens were removed in such cases without an operative death, and cure usually followed.

Malarial spleen. Chronic malaria results in a splenomegaly with generalized fibrosis and thrombophlebitis which is recognized as a form of splenic anæmia. If treatment fails, removal of the greatly enlarged spleen of this type gives relief.

Chronic splenomegaly. Finally, there is a type of chronic splenomegaly, more common in women than in men, which persists for years without great detriment to the patient beyond that due to the weight of the enlarged spleen. In the author's cases, however, chronic anæmia eventually developed, and in a few in which operation was performed the definite changes characteristic of splenic anæmia were found. It must be concluded that many such cases are quiescent types of splenic anæmia.

The operative mortality and end-results are satisfactory, considering the nature of the disease and the condition of the patients subjected to operation. All of the cases operated on were otherwise incurable and progressing to a fatal issue. The death rate from splenectomy in such instances is high, and not all patients who recover will be greatly benefited. The later in the course of the disease that splenectomy is performed, the more serious the condition that will be found. Early operation will give a low mortality and will cure a higher percentage of patients than was cured in the group herein discussed.

MISCELLANEOUS

Struthers, J. W.: Mesenteric Lymphadenitis Simulating Appendicitis. *Edinburgh M. J.*, 1921, n.s. xxvii, 22.

The author calls attention to the frequency of lymphadenitis in the neck, axilla, groin, popliteal space, and ante-cubital fossa, and comments on the rarity or absence of acute suppurative inflammation of the mesenteric lymph nodes in appendicitis, typhoid fever, and dysentery. Tuberculosis of the mesenteric glands, on the other hand, is extremely common in children and adolescents.

Within recent years a number of cases of supposed appendicitis have come under observation in which, at operation, lymphadenitis was found, that is to say, the appendix was perfectly healthy and the only abnormality detected was enlargement of the lymph glands in the mesentery with signs of peritoneal irritation over them.

The author states that in two years he has seen 22 cases of mesenteric lymphadenitis and 187 cases of appendicitis. In children and adolescents lymphadenitis is more often confused with appendicitis than any other condition.

During the acute stage the glands are not often or readily felt because of the muscular resistance present. Under anæsthesia, however, they may be more easily palpated, and when several are adherent to each other the resulting lump tends to be higher and nearer the midline than the swelling caused by the

inflamed appendix with omentum or intestine adherent to it. After an acute attack the persistence of a lump and its situation may clear up the diagnosis. Appendicitis is a treacherous condition, and in doubtful cases a wait-and-see policy is apt to be followed by disastrous results, especially in children. Another fact indicating immediate operation is that opening the abdomen in cases of lymphadenitis does not appear to influence the glandular affection unfavorably.

The author summarizes his conclusions as follows:

1. An inflammatory reaction occurs in enlarged mesenteric glands and the overlying peritoneum, the enlargement being usually, but not always, tuberculous, and giving rise to symptoms closely resembling those of appendicitis.

2. While the cause of the reaction cannot be determined definitely, it may be due to exacerbation of the tuberculous infection with peri-adenitis, to the invasion of the tuberculous glands by other organisms, i.e., the onset of a mixed infection, or to the occurrence of a transient adenitis similar to that seen in other parts of the body in association with surface infections. **FREDERICK CHRISTOPHER, M.D.**

Sencert, L. Mesenteric Disinsertions in Abdominal Contusions (Désinsertions mésentériques dans les contusions de l'abdomen). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 758.

Sencert observed two cases of abdominal contusion presenting interesting anatomo-pathologic and clinical peculiarities. In the first case the anatomical lesions were complex, consisting of rupture of the splenic artery, rupture of the pancreas, and mesenteric disinsertion of the first jejunal loop for an extent of 20 cm. with opening of the loop along the mesenteric rip. In the second case there was mesenteric disinsertion of the last loop of the ileum with complete necrosis of the disinserted loop. In this article Sencert deals only with the mesenteric disinsertions. Such lesions are rare; Sencert has found the reports of only 30 cases. In 8 of these the disinsertion was the only lesion. In all of the others this lesion was associated with other abdominal injuries. The disinsertion usually occurs in the terminal part of the ileum, but in 4 cases it was in the middle part, and in 3 in the first part. The length of loop compromised varies from 10 to 40 cm., but in a few cases was much longer.

The immediate consequence of the lesion is hæmorrhage which may be rapidly fatal or, as in one of the author's cases, not at all serious. The ultimate result is gangrene of the intestinal loop.

The clinical symptoms are of three types. There may be a syndrome of internal hæmorrhage and acute anæmia. There may be an acute peritoneal syndrome, especially if there is also an intestinal rupture not accompanied by intense hæmorrhage. In other cases there may be a syndrome of simple parietal contusion as in the author's second case. This last type, although apparently the most benign, is in reality the most serious.

In the first two types the symptoms demand immediate laparotomy. In the third there is no symptom of internal hæmorrhage or peritonitis and the surgeon will probably delay laparotomy. In the author's second case absence of symptoms continued for thirty-six hours. In this type of case, however, gangrene of the disinserted intestine following peritonitis is certain to develop. The peritonitis becomes manifest only at the end of twenty-four to forty hours after the injury. The localized pain and contraction the author referred to the parietal lesions because they coincided with the local ecchymosis.

One of the author's patients was a child 9 years of age. Both of his patients were operated upon and recovered. **W. A. BRENNAN.**

Loop, R. G.: Mesenteric Vascular Occlusion: With a Report of Nine Cases in Which Operation Was Performed. *J. Am. M. Ass.*, 1921, lxxvii, 369.

There are about 500 cases of mesenteric vascular occlusion now on record. According to the literature, this is a very rare condition and has an exceedingly high mortality. The death rate is bound to be practically 100 per cent unless prompt and proper treatment is given and probably in any event it must remain distressingly high.

The author does not believe that the condition is as rare as has previously been supposed as many such cases must pass unrecognized and deaths from this condition are often ascribed to other causes. Loop presents and analyzes nine cases. The pathologic picture is strikingly uniform and characteristic. The salient features in the order of their importance are:

1. A transparent, sticky peritoneal fluid, amber or blood-tinged in color, odorless, and without coagulated lymph. This was present in copious amount in every instance.

2. A cyanosed, plum-colored, soggy, œdematous intestine with glistening peritoneum, free from adhesions and with relaxed lumen. It is not distended but lies inert within the abdominal cavity with no tendency to crowd out of the incision, being held down by the weight of fluid within its lumen and containing little gas. It may be mottled and on the verge of gangrene in small areas but no gross gangrene was seen in any of the cases reported. Except for the absence of gas distention it resembles the congested bowel often observed in large strangulated herniæ.

3. A thick, doughy mesentery dragging down over the pelvic brim as though it were adherent. This is the most characteristic finding.

Symptomatically two types of manifestations are clearly marked: (1) the fulminating, and (2) the phlegmatic.

The small series of cases reported indicate that two prevailing ideas concerning this condition are erroneous as extensive gangrene of the bowel is not seen except in very late cases, much later than these cases would ordinarily come to operation, and

complete intestinal obstruction develops only when some of its usual causes are present as the primary condition.

The striking symptoms are: (1) disturbed function of the bowels; (2) vomiting which usually occurs early (coincident with the pain in the fulminating cases), may be almost continuous during the first hours, may become stercoraceous and blood-tinged, and tends to diminish or cease after the first six or eight hours; (3) sudden violent and agonizing pain, which marks the onset of the fulminating cases; and (4) shock, which is marked in the fulminating cases and indicates by its degree the extent of bowel involved.

Of almost equal value in the diagnosis is the absence of certain symptoms often mentioned in descriptions of this condition and ordinarily seen in the "acute abdomen." Mesenteric vascular occlusion is essentially afebrile, the temperature rarely rising above 100 degrees F. and often being subnormal. The pulse is infrequent and may be small, irregular, and thready according to the degree of shock. There is little or no muscle spasm. The flaccidity of the abdominal muscles is a very striking feature in a patient almost crazed with abdominal pain. The abdomen is not distended; neither is it scaphoid. It may be described best as rotund, but not under tension. The percussion note is dull or flat, not tympanitic.

Rational treatment is based on the recognition of the fact that the bowel deprived of its blood supply cannot recover. Elimination of the involved portion, whether it is large or small, by the quickest possible means is the only method, and the fate of the patient then rests on whether there is further extension of the process and the possibility of slow starvation if the drainage is high in the intestinal tract.

FREDERICK CHRISTOPHER, M.D.

Schiller, K.: Surgical Abdominal Complications of Influenza (Ueber die chirurgischen abdominalen Complicationen der Influenza). *Orvosi hetil.*, 1921. lxx, 1321.

During the influenza epidemic of 1918-19 and 1920 the author observed seventeen cases of appendicitis. In fourteen the condition developed during the

period of convalescence. Nine of the latter were operated upon. Of the five cases not operated upon only one progressed to the stage of exudate formation. This patient recovered but a recurrence four weeks later necessitated an operation. In one case there was gangrene of the appendix; this patient died. Nine patients with simple, non-gangrenous appendicitis were cured. In five cases the appendicitis occurred in patients who had been operated upon for pleurisy; in the others it developed following mild tracheal influenza.

In simple appendicitis following influenza the symptoms are rather mild (colic; retching; fever, 38-39 degrees C.; moderate rigidity), but in the attacks developing during the acute stage they are severe, suggesting perforation. Operation in three cases of the latter type was followed by death in one.

It is astonishing to find at operation that even in the earliest stages of the condition the pathologic changes are not localized to the appendix but involve the cæcum and the neighboring loops of ileum. The exudate is sero-fibrino-sanguinous. In some cases the mesenteric lymph glands are swollen. In the case developing in the acute stage and ending fatally small foci of pus were found in the mesenteric lymph glands and there was yellow atrophy of the liver.

The appendicitis developing in the acute stage of influenza is essentially a rapidly spreading, sero-fibrino-sanguinous peritonitis arising from the appendix. This may become cured following the removal of the appendix.

Another sequela of influenza is a peritonitis in which no involvement of the abdominal organs can be found (toxic and metastatic peritonitis). This may occur by way of the lymphatics following inflammation of the diaphragm (five cases, two becoming cured spontaneously and three ending fatally) or as a result of influenzal enteritis with perforation (two cases, one becoming cured and one ending fatally). In two cases the peritonitis was due to the rupture of a pus pocket in a mesenteric lymph gland. Like appendicitis, peritonitis following influenza occurs as a rule during the period of convalescence.

PÓLYA (Z).

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Franke, G.: Osteogenesis Imperfecta (Ueber Osteogenesis imperfecta). *Ztschr. f. orthop. Chir.*, 1921, xli, 158.

Franke first describes two cases of osteogenesis imperfecta treated at Lange's clinic.

Case 1. The patient was a girl $9\frac{1}{2}$ years old who at birth had a fracture of the right leg. In the course of the following year this leg was broken three times and the right femur also was fractured. When the

child was 3 years old she suffered a fracture of the clavicle. In the following years there were ten fractures of the right leg, and in 1911 both femurs were fractured. Each time the fracture healed rapidly but the right leg gradually became so deformed that in 1911 an osteotomy was done. Since September, 1912, the child has been unable to stand, chiefly because of the weakness and deformity of the right leg. In 1913, two days before she came to the clinic, this leg had been fractured again.

The author gives a very detailed description of the clinical and X-ray aspects of the case. The patient

presented no signs of rachitis as the epiphyses were normal and showed practically straight ossification lines. However, all the X-ray shadows of the skeleton were light, the corticalis was very thin, and the spongiosa wide-meshed. Pain was absent, the pelvis was normal, and the reflexes were not increased. Rickets and juvenile osteomalacia were excluded by the limitation of the process to the lower extremities, especially to the right leg. The femurs were at this time so hard that manual refracture was no longer possible.

Franke considers this a light case of osteogenesis imperfecta. The X-ray showed a spindle-shaped widening of the posterior arch of the second to the sixth ribs on the right side which, in the absence of a history of trauma, was unexplainable. Possibly it was due to exaggerated respiratory movements but if this was the case it would be scarcely conceivable that it would not be present on the left side also.

The treatment consisted in refracturing and straightening the right leg and a bilateral osteotomy on the deformed femur. After the operation the child was placed in an ambulatory splint and after six months she was able to stand and walk without assistance. Six years later the femurs were in good condition but the legs were markedly atrophic and strongly bowed with a tendency to the saber-shape.

Case 2. The patient was a 13-year-old girl who had suffered a first fracture of a leg in her second year and from then on to her ninth year had ten other breaks of arms or legs from very slight causes. In this case also the corticalis of the extremities was thin and the spongiosa wide-meshed. The epiphyses were entirely normal. A "chicken-breasted" condition with drawing in of the lower ribs would have suggested rachitis if the epiphyses had not been free from signs of disturbance in the development of the cartilages. The freedom from pain in the bones and the early occurrence of the fractures spoke against osteomalacia.

Franke agrees with Looser that the earlier differentiation between osteopsathyrosis idiopathica (coming on in childhood), and osteogenesis imperfecta (congenital) is not justified. Both processes agree pathologically and clinically. The conspicuous sign of bone fragility is not peculiar to osteogenesis imperfecta as it is present also in osteomalacia and rickets. In osteomalacia, however, the fractures occur first at the onset of puberty and are accompanied by changes in the pelvis, severe bone pain, and exaggeration of the reflexes, all of which are absent in osteogenesis imperfecta. The condition may be differentiated from early rickets by the character of the epiphyses which in osteogenesis imperfecta is normal. The fragility of the bones in osteogenesis imperfecta is due to insufficiency of the osteoblasts for normal endochondral ossification. In osteomalacia bone tissue is formed abundantly but does not contain a sufficient amount of calcium salts.

MARWEDEL (Z).

Painter, C. F.: A Consideration of the Etiological Factors in Myositis Ossificans Traumatica.
Boston M. & S. J., 1921, clxxxv, 45.

The author presents a detailed report of the case of a man who suffered a blow on the anterior surface of the left thigh and subsequently wrenched his left knee. The X-ray showed a calcareous deposit just above the patella and a mass of bone in the mid-thigh within the substance of the quadriceps extensor muscle. Both of these were removed at operation and were found closely adherent to their adjacent bony structures. The patient still complains of trouble in his leg which is probably due to some of the ossifying process that was left behind. The bony masses did not appear until at least four months after the injury and were probably of traumatic origin.

In reviewing the literature on this subject, Jones and Morgan in 1912 reported on 339 cases, 89 of which were their own. Of 169 cases, the condition occurred in 15 between the fifteenth and twentieth years of age; in 76, between the twentieth and the twenty-third years; in 14, between the twenty-fourth and thirtieth years; and in 25, between the thirtieth and fortieth years. The youngest patient was 5 years of age and the oldest 65 years. Jones and Morgan believe that the majority of these cases are produced by osteogenesis of avulsed periosteum which escapes into the muscles and continues to grow. Grawitz and Solmon attribute the condition to an inflammatory process.

Binnie cites two theories; (1) the organization of blood clot followed by ossification, and (2) the transplantation of a periosteal flap. He believes that the latter theory is correct and states that it is substantiated by the experimental work of Berthier.

Finney reports 6 of his own cases and reviews the literature up to 1909. He suggests that the injuries are inflicted tangentially, usually on the front of the thigh, and the resulting condition is due to the outgrowth of periosteal transplants. Most French and German observers agree with this view. Myositis ossificans must be differentiated from contusions, hæmatoma, myositis, periostitis, osteomyelitis, exostosis, syphilis, gout, and sarcoma. Finney warns against too early operation because there is likelihood of spontaneous shrinkage and degeneration.

Coley also discusses the differential diagnosis from sarcoma of the bone, and both Coley and Finney state that sarcomata are apt to be at, or near, the epiphysis, are soft and yielding to pressure, and increase steadily in size while myositis ossificans is usually in the middle of the shaft, hard on palpation, and tends to decrease after the period of growth.

In Morley's opinion myositis ossificans is due to the migration of osteoblasts into adjacent contused muscle and blood clot after destruction of the periosteum and loss of its function as a limiting membrane to the growth of bone. He suggests as treat-

ment the repair of the denuded periosteum with a fascial transplant.

In conclusion Painter states that neither periosteal transplantation nor osteoblastic migration can explain all cases; in all probability one of the following corrective factors is necessary in addition: first, retrograde changes when there is no antecedent trauma; second, repeated slight traumatism; and third, violent trauma.

R. S. REICH, M.D.

Steward, F. J.: Acute Infective Arthritis. *Brit. M. J.*, 1921, i, 727.

Infection causing acute arthritis may be transmitted to the joints from the exterior, through a wound, by extension from neighboring parts, especially from inflammation of bones, by metastasis from infected areas in other parts of the body, and through the blood in general septicæmia.

In acute infective arthritis the synovial membrane bears the brunt of the attack. If suitable treatment is applied during the early stages and before other joint structures, such as the cartilage, bone, and ligaments, are involved, recovery is usually complete. If the process continues, the joint is converted into an abscess cavity and destruction of the structures adjacent to the synovial membrane occurs. Treatment during this stage cannot at best prevent partial or complete ankylosis. Dislocation may occur as a result of injury to the ligaments.

Emphasis is placed on the fact that the synovial membrane is able to deal with infections even more efficiently than the peritoneum.

Experience during the recent war demonstrated that complete removal is the best method of treating joints infected by foreign bodies or missiles. The joint surfaces should be cleansed and the synovial membrane allowed to perfect the cure. Assistance to this membrane in the exercise of its function may be given by: (1) evacuating the pus, (2) keeping the limb at rest by the application of splints with extension, and (3) injecting antiseptics into the joint. Two per cent formalin in glycerin and ether have been advocated for this purpose.

Three cases of arthritis of metastatic origin in children are reported. These patients were treated by the method described by the author and all recovered. In two cases function was completely restored. The other patient is still under treatment. In each case the aspirating needle was used to confirm the diagnosis. In the author's opinion there need be no hesitation in employing this procedure to reach an early diagnosis.

A fourth case reported was a case of joint infection due to streptococcal infection in a neighboring bone. Amputation of the leg was necessary on account of the virulence of the organism and the patient's serious condition.

Another clinical type of infectious arthritis is that in which the diagnosis is not so simple as in the other cases described. This might be called "quiet arthritis" as there are no acute symptoms and no

pus formation. The condition is often unsuspected until the patient is convalescent, when some joint, usually the hip, may be found disorganized and fixed, and perhaps also dislocated.

MERLE R. HOON, M.D.

Bloch, R.: Coxa Vara in the Infant and the Adolescent (La coxa vara chez l'enfant et chez l'adolescent). *J. de chir.*, 1921, xviii, 1.

Following a short historical sketch, coxa vara is defined as a deformity characterized principally, but not entirely, by descent of the head of the femur. The cervico-epiphyseal angle is decreased to a right angle or even less, but in a few cases is greater than normal. In complex cases the neck is bowed forward and twisted on its longitudinal axis as though a forced hyperextension had occurred while the head of the femur was secure in the acetabulum. The head of the femur is usually more or less deformed or deviated, the cartilage on the medial aspect having disappeared. The epiphyseal cartilage is thickened or deviated, the greater trochanter is exuberant, the acetabulum is elliptical with its long axis vertical, and the pelvis on the affected side is somewhat atrophied. The internal architectural modifications of the bone are found to conform to Wolff's law, according to which the internal structure so modifies itself as best to resist the body weight.

Three forms of coxa vara are differentiated: juxta-trochanteric, medio-cervical, and juxta-capital coxa vara. The first type is that which is most common in infants. The bending occurs near the trochanters, the epiphyseal cartilage being as a rule little affected except that it becomes more horizontal, a change which explains in part the tendency of the process to correct itself through subsequent growth.

The first case reported by the author to illustrate juxta-trochanteric coxa vara was that of an infant 22 months old who developed a waddling gait. The X-ray showed that the joints were normal except that the femoral necks were horizontal. Correction occurred spontaneously while the child was kept at rest in bed during the following two months. The second case was that of a 17-year-old boy whose symptoms first appeared when he began hard labor at 15 years of age. These consisted of intermittent pains in the hips, fatigue of the legs on slight exertion, and difficulty in rising to the standing position from the squatting position. Rest in bed was not prescribed and little improvement has been noted.

The second form of coxa vara, the medio-cervical type, is that found in children about 10 years of age and frequently confused with fracture. In this type there is atrophy of the neck which seems to be fissured vertically, the femoral head is lowered, the neck is curved backward, the epiphyseal line is vertical and in the form of an inverted Y. This is a grave form as subsequent growth tends to augment the deformity. One case reported to illustrate this form was that of a child 6½ years of age whose father and two brothers had a waddling gait due to weakness

of a hip. The child presented the signs of rickets, had always been thin and frail, and began to limp and complain of fatigue at 2 years of age. The left leg was 1 cm. shorter than the right leg and abduction was limited. The X-ray showed that the left femoral head was horizontal and separated from the neck by a clear space in the form of an inverted Y (false fracture) and that the head was subluxated downward. The right femoral neck also was horizontal and showed the bird-beak profile. Two years later, when the child had almost normal function, the X-ray showed that the right side was practically unchanged, but on the left the femoral neck formed an acute angle with the diaphysis and the head was separated from the neck by a clear vertical line, the inverted Y aspect having disappeared.

The second case of medio-cervical coxa vara was that of a child 4 years of age which, at 21 months of age, developed a limp. The limp disappeared during rest in bed for three weeks but reappeared when the child was 30 months of age. Decided traces of rickets were found. Abduction, internal rotation, and extension were limited. The right leg was $1\frac{1}{2}$ cm. shorter than the left but the femurs were about equal in length. The X-ray revealed a break in continuity at the trochanteric end of the femoral neck on the right side which showed coxa vara. On the left side there was a mild degree of coxa vara and the epiphysis was more horizontal than normal. The right leg was abducted to 80 degrees, some crepitation being noted at first, and a cast applied. Two months later the X-ray showed the same aspect on the right side and an increase of the deformity on the left.

The third form of coxa vara, the juxta-capital type, is the typical coxa vara of adolescents described by Kocher. The lesion occurs at the level of union with the neck of the already formed femoral head (epiphysiolysis). The head, flattened and vertically elongated, slides down on the yielding juxta-epiphyseal region of the neck until, in some cases, a space is shown by the X-ray between the upper border of the head and the upper border of the acetabular cavity. The lower border of the head may be in contact with the lesser trochanter. Subsequent growth elongates the neck horizontally instead of correcting the deformity. Redressment by traction, however, is relatively easy.

A case reported to illustrate juxta-capital coxa vara was that of an athletic youth 17 years of age who, without any severe injury or other apparent cause, developed a waddling gait, became unable to flex the thighs to any extent, and stood and walked with marked external rotation of the thighs. The right leg was 2 cm. shorter than the left. On the left side there was spontaneous flexion of about 45 degrees and abduction between 30 and 40 degrees. On the right side flexion and abduction were impossible. The upper part of the right thigh was atrophied. Under chloroform anaesthesia abduction of 30 degrees was obtained on both sides by cautious passive

movements of circumduction. A cast was then applied and worn for two months. At the end of that time the X-ray demonstrated that the left hip was almost normal, but the right still showed epiphyseal displacement. On the left side flexion equaled 90 degrees and abduction 45 degrees. On the right side there was ankylosis. Four and one-half months later the patient was able to walk well, but could sit down only with difficulty. On the left side all motions were ample; on the right side there was flexion of 15 degrees but abduction was almost nil. The right leg was held in pronounced external rotation, and an atrophy of 4 cm. still persisted.

A troublesome complication of coxa vara is pathological fracture. In one case reported this occurred when the patient slipped, and in another, when an attempt was made to reduce what was supposed to be a dislocation of the hip. Both fractures healed readily in casts.

The author states that he does not give unqualified support to the traumatic or the static theories of the etiology of coxa vara and in this connection cites the case of a child of 8 years who was treated by bed-rest during the entire development of the disease, a period of eighteen months. The process began as an area of decalcification in the neck of the femur and advanced to the typical deformity of the mid-cervical type.

The principal conditions from which coxa vara must be differentiated are fracture of the femoral neck and separation of the epiphysis. These are excluded, however, by the typical X-ray picture of coxa vara, the absence of severe trauma with immediate inability to use the limb, reductibility with crepitation, and the absence of X-ray evidence of displacement of fragments and epiphyseal separation. Other conditions to be differentiated are arthritis, congenital dislocation, and habitual dislocation of the hip.

The treatment consists of rest in bed with continuous extension. Later, when the process is no longer active, subtrochanteric osteotomy may improve the motion of the joint.

JOHN W. BRENNAN, M.D.

FRACTURES AND DISLOCATIONS

Tavernier, L., and Jalifier, A.: The Pathologic Anatomy and Treatment of Recurring Dislocations of the Shoulder (*Anatomie pathologique et traitement des luxations récidivantes de l'épaule*). *Rev. d'orthop.*, 1921, viii, 275.

The authors state that when cases of recurring dislocation of the shoulder joint are treated by simple denudation of the capsule and plication without opening and exploring the joint cavity it is impossible to secure permanent results. In this connection they report two illustrative cases.

CASE 1. The patient was a well-developed man 37 years of age whose shoulder was first dislocated by trauma six months previously. Since then there had been seven or eight other dislocations. Reduc-

tion was always easy. No osseous lesion was shown on X-ray examination. Operation with wide opening of the capsule disclosed a large recess in the capsule extending in front of the glenoid cavity along the anterior surface of the scapula to a depth of about 3 or 4 cm. This was closed off by means of strong catgut sutures including the border of the labrum glenoidale. The capsule and skin wound were then closed. There has been no recurrence during the past three years.

CASE 2. The patient was a well-developed man of 38 years. The first dislocation of the shoulder occurred two years previously as a result of violent trauma. One year later an operation was performed following the seventh dislocation. After this operation, however, the dislocation occurred as easily as before. At a second operation a lax capsule was found. The tendon of the subscapular muscle was poorly developed and appeared to have been torn, the ends uniting subsequently with the capsule. The antero-inferior portion of the labrum glenoidale was loose and hanging in the cavity. A recess in the capsule extending antero-internally to a depth of at least 4 cm. communicated with the joint cavity below. The recess was closed with three sutures including the labrum glenoidale, and the capsule then closed. The subscapular tendon was repaired with catgut sutures. To date, after one year, there has been no recurrence.

JOHN W. BRENNAN, M.D.

Henderson, M. S.: Habitual or Recurrent Dislocation of the Shoulder. *Surg., Gynec. & Obst.*, 1921, xxxiii, 1.

The author discusses the essential factors involved in the mechanism of recurring dislocation of the shoulder. The primary dislocation causes a tear in the capsule in the weakest and most lax region; that is, at its anterior portion. This area is not supported by the tendinous insertions of muscles for above it is the subscapularis and below it are the few fibers of the triceps which have their origin from the glenoid margin. The supraspinatus and infraspinatus tendons may be torn at the first luxation and as true tendon is always replaced by scar tissue the repaired tendons may stretch. The insertion of these muscles may be actually torn off and relaxation and loss of tone may ensue so that the head of the bone is just a trifle lower than it should be.

When the arm is in the position in which most of the dislocations occur, namely, abduction above the level of the glenoid fossa and slightly forward, the supraspinatus and infraspinatus do not have their normal tension and therefore allow the head of the bone to be a little lower than normal. At the same time the teres major, the latissimus dorsi, and the pectoralis major all tend to pull the head into the glenoid fossa and also downward and forward. The supporting action of the subscapularis is gone as the slightly abnormal low position of the head of the bone puts the muscle on the upper half of the head of the bone in the position it now occupies.

The head is thus thrust against the weak area in the capsule below the subscapularis, and as the powerful latissimus dorsi, teres major, and pectoralis major contract, the head slips on the edge of the glenoid margin, bulges out the capsule, and glides up usually to a subcoracoid dislocation.

In the cases reported, 25 in all, the average age was 28 years. There were 20 males and 2 females. The cases were equally divided as to the side involved. Trauma was mentioned as the initial cause in every case but 1. Only 2 of the patients were epileptics. Nineteen were operated on. In 3 cases the operation was performed so recently that the end-result is still unknown. The operation was a capsulorrhaphy. Seven patients (43 per cent) were cured; 4 patients (25 per cent) were decidedly benefited, that is, have had very few dislocations since and are satisfied with the result; and 1 (6 per cent) was benefited. Three operations (18 per cent) were failures. One patient (6 per cent) has not been traced. The first two groups of successful operations were performed on 11 patients (68 per cent).

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Skinner, M.: On the Surgery of Bones and Joints, with a Description of New Operative Technique. *South. M. J.*, 1921, xiv, 558.

The author states that it is important to consider the deformities in acute arthritis, recent fracture, traumatic joint, and diseases of the nervous system as part of the ultimate pathology. Every arthritis or penetrating joint wound is a potential deformity. Proper treatment implies splinting in a position exactly opposed to the position the joint takes when it is inflamed. Usually the latter is a poor one in regard to function. The prime consideration in the treatment of arthritis is to guard against deformity by proper splinting. The hip should be fixed in slight abduction and extension, the knee in full extension, the ankle in dorsiflexion, and the wrist in hyperextension.

In the operative treatment of old dislocation of the elbow the chief difficulties are avoidance of the ulnar nerve and preservation of a field which allows accurate manipulation and replacement of the joint without injury to the coronoid and olecranon processes of the ulna. The operation described by the author seems to answer these requirements and to be without the disadvantages of other procedures.

The incision, which is slightly S-shaped, begins about $\frac{3}{4}$ in. above the olecranon at a point midway between the olecranon and the humerus and passes downward and forward to a point just below the radial neck. The joint capsule and fibrous tissues are freely incised and dissected back from around the head and neck of the radius. The neck of the radius is divided and the head removed. The field is then much enlarged and ready access may be had to the

olecranon fossa and the articular surface of the humerus. The fibrous tissue is excised and the joint reduced. The joint should go through its full range of motion. The elbow is then flexed to a point 60 degrees from the straight and the forearm fully pronated. In this position, the capsule, soft parts, and skin are sutured. Voluminous dressings are applied, the tourniquet is removed, and the elbow, arm, and forearm are encased in a light plaster cast with a large fenestrum over the posterior surface of the elbow. At the end of eight or nine days the arm is released from the cast and the patient encouraged to move the joint actively. If full movement has not returned in two months, passive movement under anaesthesia is necessary.

The author's technique for arthroplasty of the hip is as follows:

1. Reflect a U-shaped flap from the external aspect of the thigh over the hip joint, the base of the U being over the great trochanter. Make a 2-in. incision from the base of the U. Extend the incisions through the fascia lata.

2. Pass a Gigli saw behind the muscular attachments of the great trochanter and divide the bone obliquely downward.

3. Approach the joint by reflecting the flap containing the fat and fascia upward and turning the great trochanter up.

4. Identify the capsule, incise it, and strip it back well on the ilium.

5. With a large bone chisel, sever the femur from the ilium, with care that the line of incision is in the line of the joint and not through the neck of the femur.

6. Flex and adduct the thigh and dislocate the femoral head. Excellent exposure is obtained.

7. Ream out the acetabulum and fashion the femoral head so that when the joint is reduced it will move freely.

8. Dissect up the two outer glutei from their point of insertion into the trochanter, perforate the muscle flap at its base, thread the great trochanter through this perforation, and allow the two glutei muscles to drop naturally between the bones. Secure the flap in position with interrupted sutures, and secure the great trochanter in place by suturing its margins or nailing it. Close the skin and extend the extremity. Place the patient in an abduction frame with traction or in a plaster cast. To prevent potential deformity which would be eversion and outward rotation of the femur, rotate the femur inward and fix it in this position. In ten days begin massage and very gentle passive and active motion. Allow attempts at weight-bearing in six or seven weeks. If necessary, secure greater range of motion later by manipulation under anaesthesia.

Skinner cites a case of tuberculosis of the ankle in a girl of 15 who had worn a cast for eighteen months. The operation performed was as follows:

With the foot in equinus position an incision was made through the skin and soft tissues from a point

3 in. above the articular line of the joint to 2 in. below it. With a twin saw, a gutter $2\frac{3}{4}$ in. long was made in the tibia and a similar gutter $\frac{3}{4}$ in. long in the astragalus. A hole was bored in the neck of the astragalus in the same line. A bone graft from the other leg was then inserted into the hole and the upper end mortised into the tibial gutter with gentle taps of the hammer.

The first X-ray examination made six weeks later showed the graft uniting. Three months later the patient was able to walk. This operation should be done under most rigid asepsis.

The different operations described are shown by several illustrations. FRANK G. MURPHY, M.D.

Stoffel: Indications and Technique for Osteotomy, Osteoclasis, and Redressment (Indikation und Technik von Osteotomie, Osteoklase und Redressement). *Verhandl. d. Kong. d. deutsch. orthop. Gesellschafts.*, 1921, v. 18.

The plan of treatment must be adapted to the general disease, the progress of the condition, and the patient's social status. The treatment of the bone should not be the cause of injury to other organs. The general treatment is very important. In the florid stage an expectant attitude should be maintained as far as possible and during the night the bone should be splinted. The soft bones of the small child should be let alone as much as possible. After the disease has run its course, operation is harmless and the results are much more certain.

Osteotomy is the most favored procedure but in certain cases epiphyseolysis, redressment, and osteoclasis may be indicated. Osteotomy should always be linear, the wedge-incision not being necessary. Open osteotomy offers important advantages. The bone should be well chiseled through so that the lamella on the convex side may be fractured with ease. The lengthening of the soft parts must not be forgotten; for example, the tendon of Achilles should be lengthened by an open plastic, and after the bone has been chiseled through and its axis has been corrected, the tendon should be sutured to the proper length. When there is marked deformity of the tibia, multiple osteotomy at one sitting may be done. In such cases the bone should not be cut through entirely but should be nicked in two or three places, chiseled, and then broken.

WIRTH (Z).

Henderson, M. S.: Autogenous Bone Transplantation. *J. Am. M. Ass.*, 1921, lxxvii, 165.

The author's study is based on the records of 413 patients on whom bone transplantation had been performed at the Mayo Clinic between January 1, 1913, and January 1, 1921. Operations were performed on 166 patients for tuberculosis of the spine and on the remaining 247 for non-union.

Of the 166 patients with disease of the spine, 66 (50 per cent) of the 132 traced may be said to be cured as they have been able to take up some form

of work and are earning their living. Twenty-nine patients (21.9 per cent) were improved and 22 patients (16.66 per cent) were unimproved. Three patients died, an operative mortality of 2.26 per cent. One died of pulmonary embolism on the fourteenth day and 2 died of tuberculous meningitis about the fourth week after the operation. Twelve patients (9.09 per cent) died later, practically all of disseminating tuberculosis.

There were only 4 cases of infection (2.4 per cent), which is remarkable as each patient had two large incisions. Two of these infections were due to the rupture of tuberculous abscesses through the incision. Bone grafts were lost in 2 cases. In a few instances devitalization of the skin over a prominent kyphos caused an ulcer. The graft was fractured in 4 cases and in 2 cases a second operation was done. Occasionally one end of the graft came loose because the graft was put in under tension. A curved graft which can be obtained from the flat internal surface of the tibia is now used when the curve is considerable. Beef-bone screws are used when possible to fasten the graft to the spinous processes. The operation is distinctly beneficial to adults but is rarely advised for children.

Two hundred and twenty-three patients who had had bone grafts for ununited fractures were traced. Of these operations 177 were successful (79.3 per cent), and 42 were failures (18.8 per cent). There were 4 deaths (1.7 per cent). Three deaths were due to influenza and 1 to cerebral embolism. The massive graft has given the best results. In this method a large graft is used and its cancellous tissue is placed against the cancellous tissue of the fragments. These layers are rich in osteoblasts.

Infections in patients operated on for ununited fracture ran much higher than in the spinal cases. This can be explained on the ground that some of the patients were previously infected and many who had not been previously infected had been operated on and had much scar tissue. The latter were difficult to operate upon and considerable trauma was necessary during the procedure of loosening the fragments and getting sufficient exposure to carry out the bone-grafting operation. Two hundred and one patients were operated on who had not had infections previously, and of this number 20 (10 per cent) became infected. In 46 patients who had been previously infected there were 19 infections (43.4 per cent). Of the 39 infected cases the graft was lost in 15 but this does not necessarily mean that the operation was a failure.

The bones giving the best results were as follows: tibia, giving the highest percentage of successes, 89.4 per cent out of 95 traced cases; ulna, 81.2 per cent; radius, 78.4 per cent; humerus, 67 per cent; and femur, 57.5 per cent. In difficult cases it is better to perform the operation in two stages, first exposing and freshening the end and then, about a week or ten days later, applying the bone graft if infection has not arisen.

Schaedel, W.: Meniscus Injuries (Ueber Meniscusverletzungen). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 607.

Following a review of the history of meniscus injuries the author describes the anatomical relations as a knowledge of these is essential for a proper understanding of the mechanism of such injuries. He calls attention to the fact that the medial meniscus is attached not only to the capsule all around but also, unlike the lateral meniscus, to the ligament of the corresponding side (ligamentum collaterale tibiale). Mobility of the medial meniscus is of greater importance than mobility of the lateral meniscus as the axis of rotation falls through the lateral half instead of the middle of the joint and, as sudden lateral rotation occurs much oftener than medial rotation, the medial meniscus is injured more frequently than the lateral meniscus.

The author found the lateral meniscus involved in only 2 of 19 cases. The injury may occur through hyperextension, movements of rotation in the flexed position, pressure, and reflex extensor movements. Medial rotation is dangerous for the lateral meniscus and lateral rotation is dangerous for the medial meniscus.

The clinical symptoms consist in tenderness on pressure in the region of the involved joint (a characteristic pressure point is 2 to 3 cm. from the patellar tendon), inability to extend the knee completely, swelling of the joint, and dislocation of the meniscus. In the differential diagnosis movable bodies and the pinching of fat tags (Hoffa) may offer difficulties.

The treatment generally demands surgical procedures. Of the 19 cases reviewed 15 were operated upon through either an anterior or a posterior longitudinal incision. The posterior incisions were placed at the border of the popliteal space in front of the attachment of the muscle. Only the injured and dislocated parts were removed. In general, the results were good. PLENZ (Z).

Patel: The Results of Extensive Knee Resections in War Surgery (Des résultats de la résection large du genou en chirurgie de la guerre). *Bull. et mém. Soc. de chir. de Par.*, 1921, lxxvii, 619.

Up to the time of the war it was generally believed that amputation was preferable to extensive knee resection involving shortening of the limb exceeding 10 cm. During the war, however, the final results in many cases of extensive knee resection were studied.

Patel has traced nineteen patients on whom he performed resections of the knee for war wounds in 1917 and 1918. In each case the resection exceeded 8 cm. Three of these patients died later from influenza. Of the remaining sixteen, three subsequently had a secondary amputation and thirteen have recovered. In two cases the shortening is 8 cm., in one, 9.5 cm., in one, 11.5 cm., in three, 12 cm., and in four, 14 to 18 cm. These patients are unable to walk without the aid of prosthetic appliances.

The cases in which extensive resections were done were principally infected articular fractures or knee resections followed by non-union and sepsis.

X-ray examination some months after union in cases of resection of the knee reveals interesting anatomical changes; the tibial plateau is thickened and the femur shows bone stalactites and is ensheathed by two lateral bony projections which suggest two femoral condyles grafted to the upper extremity of the tibia. A most remarkable bone adaptation results which assures solidity of the new ankylosis and constitutes further proof that in a young person the osseous system is constantly changing and that when infection is arrested osteogenesis continues.

Radiographs taken two years or more later show complete fusion of the two bones, the femoro-tibial mass being thickened throughout its entire extent. This is the end-result.

W. A. BRENNAN.

Koenig: Operative Exposure of the Ankle Joint (Operative Freilegung des Fussgelenkes). *Zentralbl. f. Chir.*, 1921, xlviii, 668.

Partly because of the mutilating character of the usual incisions for exposure of the ankle joint (cutting the extensor tendons or important ligaments), and partly because the exposure obtained by these incisions is insufficient, the author has been operating since 1905 as follows:

Beginning just back of the internal malleolus, the incision is continued upward, parallel to, and in front of, the Achilles tendon and then about 4 cm. above the malleolus is turned forward across the surface of the tibia and at its anterior edge obliquely downward and forward, outlining a tongue-shaped flap. This incision is then made through the periosteum and an oblique osteotomy of the tibia is performed through the upper transverse incision into the talocrural joint. The incision is then continued downward through the joint capsule and in the direction of the median border of the tibialis anticus, a finger-breadth below the tip of the malleolus. This having been done, the large flap of bone and soft parts is turned downward and backward. Following the operation the flap is fastened in place again with wire sutures or nails.

The author has used the method in five cases of subcutaneous injury, and twice in the performance of an arthrodesis of the ankle joint. Exposure during the operation and the subsequent healing were good. A disadvantage of the method consists in the fact that the surgeon is unable to get at the lateral joint surfaces of the tarsus. For this, a curved incision forward from the fibula is necessary.

WEHL (Z).

Schulz, O. E.: A Tendon Plastic on the Foot (Zur Sehnenplastik des Fusses). *Časop. lékař. česk.*, 1921, lx, 277.

To correct the abnormal position of the heel in deformities of the foot Schulz has devised a plastic tendon operation which holds the heel securely in the

corrected position. In pes planus he endeavors to pull the calcaneus into supination and maintain it in this position. To this end, the tendon of the peroneus longus is cut at the sole, drawn out from its tendon sheath, and passed through the space between the deep muscles of the calf and the triceps suræ to the medial side of the foot behind the medial malleolus. A canal is then formed between the plantar surface of the calcaneus and the ligamentum longum. Through this canal the cut tendon is drawn to the lateral surface of the calcaneus where it is secured with sutures to the periosteum of the calcaneus under tension, the heel being maintained in supination. Schulz performed this operation on a 12-year-old child with paralytic flat-foot.

For the correction of pes varus a similar procedure is suggested but so far the author has performed it only on the cadaver. To bring the heel into pronation, the tendon of the flexor of the great toe is cut at the level of the os naviculare and drawn out above the ligamentum lancinatum. It is then drawn as before through the space between the deep muscles of the calf and the triceps suræ to the lateral side of the leg and through the canal formed between the plantar surface of the calcaneus and the long plantar ligament to the medial surface of the heel bone where it is then fastened on the periosteum.

For the correction of pes calcaneus a combination of both the procedures described is suggested. The tendons of the peroneus longus and of the flexor hallucis longus are drawn through the channel under the heel bone so that the tendon of the peroneus may be sutured to the medial surface and the tendon of the flexor of the great toe may be sutured to the lateral surface of the calcaneus. The end of the tendon of the peroneus is sutured under tension to the tendon of the flexor of the great toe and that of the flexor of the great toe to that of the peroneus. A sling is thus formed which tends to elevate the heel. It is still better to bore two canals through the heel bone, draw both tendons through, and then complete the operation as described. This procedure has been used with good results by the author in a case of paralytic pes calcaneus.

KINDL (Z).

Straus, D. C.: A New Method of Treating Recent Fracture of the Os Calcis. *J. Am. M. Ass.*, 1921, lxxvii, 176.

Fracture of the os calcis is rather common. In the great majority of cases it is due to a fall from a height. The os calcis is suddenly held rigid while the weight of the body is transmitted to the astragalus which acts as a wedge. The tuberosity of the os calcis is forced upward by the impact. As a result, the line of fracture usually extends downward from the concave articular facet beneath the wedge-shaped articular surface of the astragalus. Not only is the posterior fragment of the os calcis driven upward by the impact at the time of fracture, but it is held in this position by the constant tone of the Achilles

tendon. The latter presents the chief obstacle to reduction. The longitudinal arch of the foot gives way at the time of fracture, and traumatic flat-foot results.

The reduction is effected on a Hawley table and under general ether anæsthesia. A long Steinmann pin of the latest type, which screws together at its center, is used. After the upper surface of the body of the os calcis immediately in front of the Achilles tendon on the medial side of the foot has been palpated, the Steinmann pin is pushed through the skin from the medial to the lateral surface of the heel so as to avoid striking the posterior tibial vessels and so that it lies immediately above the body of the os calcis, anterior to the Achilles tendon, and extends an equal distance beyond each side of the foot.

The Steinmann caliper is then applied to the pin, and downward traction is made by an assistant who stands at the end of the table. The reduction is effected in the usual manner. Any impaction present is broken up. The posterior fragment is drawn strongly downward while the anterior portion of the foot is forced downward and strongly inverted, counterpressure upward being made against the anterior fragment of the os calcis and the arch of the foot by means of an orthopedic block. The block aids also in correcting the median displacement of the astragalus. The foot is held in the corrected position, and sheet-wadding is applied from the knees to the toes. A plaster-of-Paris cast, reaching from the tuberosity of the tibia to the heads of the metatarsal bones, is then applied. While the cast is setting, continuous traction downward is maintained.

The cast is left on for four weeks. It is then removed and passive motion, massage, and hot foot baths daily are begun. The patient is not allowed to bear any weight on the foot until the end of ten weeks. He is then fitted with an arch support, and begins to walk with the aid of crutches.

The chief advantage of this method is that it permits continuous downward traction of the posterior fragment and upward pressure of the arch with the foot held in the proper position during the entire time necessary for the application and setting of the plaster cast.

LEO C. DONNELLY, M.D.

ORTHOPEDICS IN GENERAL

Osgood, R. B., Soutter, R., Low, H. C., Danforth, M. S., Bucholz, C. H., Brown, L. T., and Wilson, P. D.: *Fifteenth Report of Progress in Orthopedic Surgery*. *Arch. Surg.*, 1921, iii, 181.

Tuberculosis. Albee's spinal graft was used in the treatment of 100 out of 405 cases of tubercular spine observed at the Mayo Clinic. Two important points brought out by this study are that the cases should be properly selected and postoperative support and treatment are important until the active disease subsides. Calvé says the spinal graft is useless for the early stages in children but is in-

dicated in the cases of adults. Ely does not regard the operation as invariably curative; the mortality is by no means negligible. Doche, in a study of 140 cases near Bordeaux, found the mortality high in those with infected sinuses and attributed the infections to unwarranted opening of abscesses. Portman states that suboccipital Pott's disease is sometimes mistaken for mastoiditis. In the former the pain is slight but accentuated on movement of the head; in the latter it is severe but not influenced by head movements.

In cases of tuberculous abscesses Durante gets good results by injecting a hypertonic salt solution (2.5 per cent magnesium chloride) after evacuation to attract lymphocytes to the focus. Bier gives heliotherapy first place in the treatment of bone and joint tuberculosis. He considers the artificial sunlight lamp a good substitute for real sunlight. Ryer and Ernst of the Finsen Institute find the cool arc lamp better than the mercury lamp for this purpose. In the treatment of joint tuberculosis there is a general tendency toward painless motion without weight-bearing instead of rigid immobilization and more reliance than formerly is being placed on heliotherapy and other forms of radiant activity.

Syphilis. Among the natives of Morocco, Lacapere and Laurent found syphilitic joint lesions fairly common. Roberts reports 10 cases of Legg's disease of the hip which improved under antisyphilis treatment. He believes they were due to hereditary lues. The literature on this subject impresses upon us the advisability of considering syphilis as a possible cause in all cases of obscure joint lesions.

Rachitis. Defective digestion of fats instead of calcium deficiency is considered by Pereda to be the condition responsible for rachitis. Cow's milk, which is richer in calcium than human milk, may cause rickets. Endocrine insufficiency is proposed as an etiological factor by Corominas, who suggests the use of epinephrin in the treatment. After treating twenty-four cases for four months with artificial sunlight lamps, Huldshinsky found that the bones appeared normal on roentgen examination.

Poliomyelitis. In an epidemic in Uruguay the only efficacious treatment was intraspinal injection of convalescent serum. Rosenow has some evidence from animal experiments which prompts him to suggest that herpes zoster is due to an acute posterior poliomyelitis and that serum from a herpes patient will neutralize the virus of infantile paralysis. In the treatment of the residual paralysis Szulinski has obtained good results by substituting a strip of fascia for a paralyzed trapezius muscle, suturing one end to the second and third dorsal spines and the other through a hole in the spine of the scapula.

For the treatment of flail shoulders Steindler finds arthrodesis more satisfactory than tendon transplantation. He does arthrodesis also for flexion contracture of the wrist, obtaining a hyperextended position and then doing tendon transplantation to get extension power in the fingers. The best efforts in

tendon transplantation seek to utilize muscles of the same general motor purpose to supplant the paralyzed muscles: flexor for flexion, extensor for extension. It is wise also to follow the methods of Lorenz and Perthes, separating the tendon from the paralyzed muscle high up and uniting it with the strong muscle at a similar high level, thus preserving the gliding action.

Spastic paralysis. In cases of spastic paralysis the peripheral nerve resection of Stoffel has many adherents on both sides of the Atlantic. The operation seems to hold out some hope for the apoplectic cases as well as those due to trauma of the spine.

Obstetrical paralysis. Sever maintains that operation should not be done for Erb's palsy until all possible improvement has been obtained by massage and muscle training. If necessary, he divides the tendons of the pectoralis major and subscapularis to obtain full external rotation and abduction. The lower arm type justifies early exploration of the brachial plexus. Taylor advocates this operation for all cases but Boorstein agrees with Sever. The bulk of the evidence points to a lesion of the brachial plexus as the cause of the paralysis.

Cervical ribs. The symptoms of cervical rib—pain, pulsations, œdema, aneurism, gangrene, muscle atrophy, etc.—are more common on the left side, but are unilateral in 95 per cent of the cases. Rovsing removes the extra rib through a posterior incision 2 cm. from the spinous process, thus avoiding hæmorrhage and nerve injury.

Congenital dislocation of the hip. Tubby finds that in congenital dislocation of the hip the iliopsoas tendon sometimes constricts the capsule and forms an obstacle to reduction. After this tendon is divided and the constricted capsule is opened the head may be slipped into the acetabulum easily. In old cases in which reduction is impossible Lorenz and von Baeyer do a subtrochanteric oblique osteotomy and then force the upper end of the shaft upward and inward toward the acetabulum. This is said to give a stable weight-bearing hip but is applicable only to unilateral cases.

Bone tumors. On the basis of a study of 250 cases of bone sarcoma, Coley emphasizes the importance of early diagnosis. In cases of deep and steadily increasing boring pain exploration is justified to determine the possible presence of a sarcoma. Although giant-cell sarcomata are not malignant, death occurred from metastases in 8 of Coley's 40 cases which were diagnosed as of that type by leading pathologists. This shows the difficulty in determining the type. The percentage of cures lasting three years was 14 per cent in Coley's clinic, 8.2 per cent at the St. Bartholemew clinic, and 11.1 per cent at the St. Thomas clinic. According to Moore's roentgenological studies, metastatic carcinoma of bone may be osteoclastic (honeycombed) or osteoplastic. The former usually comes from breast cancer and the latter from cancer of the prostate. The spine was found to be the most common site of bony metastases.

Osteomyelitis. From an experience of 266 cases, Rost concludes that it is not necessary to open the bone in cases of subperiosteal abscess. In this he is supported by Starr, who warns against too radical surgery for acute osteomyelitis in children. Rather than run the risk of opening into healthy bone tissue, Vignard avoids operation and induces an abscess over the affected bone by applying a turpentine poultice. The results of this procedure have been gratifying. Gregoire has great faith in vaccines, and punctures the abscesses only to relieve tension. Gallie finds that in the old chronic cases radical measures are necessary. Mild sepsis seems to be a stimulant to osteogenesis. Pedunculated muscle or fascia flaps are of great aid in promoting rapid healing.

Osteochondritis. Kreuter, who examined 4 cases of Legg-Calvé disease of the hip at autopsy, believes the condition is a true deforming arthritis which is primary in the joint cartilage, the changes in the shape of the femoral head being due to function. Scheuermann reports 105 cases of a spinal lesion which he believes is analogous to osteochondritis of the hip.

Bone lesions in yaws. By means of the X-ray Maul demonstrated rarified areas in the bones of 20 per cent of cases of yaws. These areas were elliptical, parallel with the long axis of the bone, and either central or cortical. All of the patients improved under treatment with potassium iodide and arsphenamin.

Loose bodies in the knee joint. The presence of loose bodies in the knee joint is considered by Colvin to be due to infection rather than trauma. Aching precedes the severe pain and locking of the joint which occur only after the loose body breaks off and becomes free in the joint cavity.

Willems' treatment. In 18 cases of knee infections treated by active mobilization by Williams and Hetzel a stiff joint resulted in only 2 and resection was necessary in only 1. Of 16 similar cases in which the knee was not mobilized ankylosis developed in 4, amputation was necessary in 3, resection was required in 1, and good motion resulted in 1.

Fractures. There is general consensus of opinion that the Thomas splint, used either alone or with suspension, is a valuable aid in the treatment of fractures of the lower limb. Bone grafting for fixation has been generally accepted, thin osteoperiosteal grafts being used for small bones and massive grafts with wide contact surfaces for the large bones.

Peet finds in the literature 169 cases of central dislocation of the hip with fracture of the acetabulum. Reduction by pressure from within has been unsuccessful. Manipulation under anæsthesia with subsequent fixation in full abduction gives the best results. Of 120 cases of fracture of the neck of the femur seen at the Mayo Clinic, only 26 were thought suitable for operation. The autogenous fibula graft gave the best results. For the fresh cases Campbell is enthusiastic over Whitman's abduction method. He reports 116 cases.

With regard to fractures of the patella Hewitt holds that if the break is in the upper third, operation is necessary, but if it is in the middle and there is no comminution, conservative treatment is sufficient. He states that refracture through the old callus is common.

Amputation stumps. The Italian surgeons have awakened enthusiasm over the cinematization of amputation stumps. The club motors seem to be more in favor than the skin-lined tunnels. With regard to amputations through the foot, it is generally agreed that the Chopart and Pirogoff methods should be abandoned. Orr favors the Lisfranc amputation, and Irwin the Syme amputation, unless a good plantar flap can be saved.

Recurrent dislocation of the shoulder. Ollerenshaw advocates the Clairmont method for the treatment of recurrent dislocation of the shoulder. A flap is made from the posterior edge of the deltoid, brought through a split in this muscle, and sewed to the anterior part. In this manner a sling is formed which passes around the head and neck of the humerus, contracts with the rest of the muscle when the arm is abducted, and serves to hold the head in the glenoid.

W. A. CLARK, M.D.

Utgenannt, L.: The Treatment of Congenital Club-Foot from 1914 to 1918 and Its Results (Die Behandlung des angeborenen Klumpfusses von 1914-1918 und ihre Erfolge). *Ztschr. f. orthop. Chir.*, 1921, xli, 63.

The modern treatment of club-foot is based on the teachings of Krauss, Wolff, and Lorenz. Of the 100 cases treated at the Lange Clinic during the past four years, 94 were treated under anæsthesia by "modeling redressment" during which, to prevent fracture of the malleolus, the lower leg was pulled taut in a fixation apparatus and in the more difficult cases of older children the Lange table with girdle-pull was used.

If complete reduction is not obtained at first, the pes equinus often offers considerable difficulty. In such cases the foot should be placed in a plaster dressing for two weeks as the bones will then have become so soft that another attempt at manual redressment may be successful, especially if tenotomy of the Achilles tendon according to Bayer is added. If the result is still not satisfactory or if spastic contractions develop, a wedge-shaped excision of the calcaneus and cuboid is necessary. This was done in 6 per cent of the cases reviewed.

Marked medial rotation of the lower leg may indicate operative procedures such as transverse incision of the tibia. Genu valgum nearly always corrects itself under kinesietherapy. In only 2 per cent of the cases was it necessary to do a supracondylar osteotomy to prevent the development of flail joint. The plaster of Paris cast is applied with the patient lying supine, the knee bent at right angles, and the foot held by the toes and heel in as marked over-correction as possible. The cast should be padded with cellulose bandages held by adhesive, and during the next eight days the amount of padding should be varied according to the swelling and circulatory disturbances.

If the result is satisfactory after fourteen days of rest in bed, an ambulatory splint-dressing may be applied with the foot as much as possible in over-correction, and for the next two months the patient may be allowed up and about. If the correction then obtained is found not sufficient, other redressments and plaster dressings must follow. The average duration of plaster-cast fixation is about four months.

Complications of the redressment procedure consist of lacerations of the sole of the foot, which heal under treatment with tincture of iodine and sterile dressings; hæmatomata, which disappear when the part is elevated; œdematous swelling, which disappears when the cast and the deeper layers of bandage are cut; epileptiform seizures, which are influenced favorably by saline infusions, loosening of the bandages, and the administration of bromides; and decubitus from the plaster cast, which is not a rare complication and usually occurs on the big toe.

In the after-care, special attention must be paid to the muscles, particularly the peroneal muscles and the dorsal flexors of the foot. Early removal of the cast is to be striven for. Following the removal of the cast, Lange's external night splint and the club-foot retainer reaching to the tips of the toes and gripping the great toe snugly from the lateral side should be applied. Exercise is also essential.

In the cases reviewed good standing function was obtained in 47 per cent (the extensor digitorum and peronei functioning well) and about mid-posture of the foot in 14 per cent. A tendency to recurrence was present in 12 per cent; recurrence in 12 per cent; and over-correction to planovalgus in 15 per cent.

SIMON (Z).

SURGERY OF THE SPINAL COLUMN AND CORD

Feil, A.: Occipitalization of the Atlas and Congenital Torticollis (Occipitalisation de l'atlas et torticollis congénital). *Presse méd.*, Par., 1921, xxix, 515.

From the anatomical point of view there are two types of occipitalization of the atlas: the unilateral and the bilateral.

In the unilateral type the first vertebra is fixed to the occipital bone by only one of its articulating processes and the sinking and atrophy are very marked, causing characteristic deviation of the head.

The occipitalized first cervical vertebra usually has a rotation movement about its vertical axis.

This fact of its importance in explaining certain clinical signs (rotation of the head).

The occipitalization may be without complications, but quite often is associated with other malformations such as hemivertebrae, a reduction in the number of vertebrae, and cervical spina bifida.

The two anatomical forms have different clinical pictures. When in the bilateral form the fusion is effected symmetrically by the two lateral processes of the atlas, deviation of the head is absent or scarcely perceptible. It is rare, however, that the occipitalization is exactly the same on both sides; union is more close on one side than the other and this difference causes a deviation of the head similar to that in the unilateral type. If the atrophy of the atlas is considerable, and especially if there is a welding of several cervical vertebrae, as is frequently the case, decreased height of the neck will be evident; in some cases the syndrome of a numerical reduction in the number of the vertebrae will be noted (absence of a neck, low hairline, limitation of movements of the head).

The unilateral type is the most interesting as it is manifested clinically by the most definite torticollis. The head is inclined from the occipitalized side to a greater or less degree according to the gravity of the deformity. In certain persons the torticollis is very pronounced and, in addition to the deviation of the head, there is a movement of rotation similar to that of the most typical muscular torticollis. In others the deviation is less marked and the rotation is slight or absent. This torticollis, in spite of its bony origin, is not always absolutely fixed; it may become decreased or exaggerated transitorily. These variations depend nearly always on contraction of the antagonist muscles or, as determined in several instances by Bertolotti, on a true muscular torticollis which adds its effects to those of the osseous anomaly.

In uncomplicated occipitalization flexion and extension are usually normal and only lateral movement is restricted. These patients have trouble in moving their jaws; sometimes this difficulty is so great that it is impossible to make roentgenograms through the mouth.

Kyphoscoliosis, a deviation of the upper end of the spinal column, is frequently, though not always, associated with occipitalization of the atlas. Also in the majority of cases of osseous torticollis, as in congenital muscular torticollis, there is craniofacial atrophy on the affected side.

A point which is particularly characteristic is the age at which torticollis appears. As occipitalization of the atlas is congenital in origin, it would seem that the torticollis would be visible from birth. This is rarely the case; ordinarily no deviation is noted until between the sixth and tenth years, and sometimes later, when ossification of the skeleton is completed.

This late appearance of the deviation of the head, its exaggeration during growth, the variations of torticollis when contracture of the sternocleidomastoid adds its effects to those of the osseous

anomaly, render the diagnosis from muscular torticollis difficult. However, the following facts will aid:

1. The deviations, and especially the rotation of the head, are generally more distinct and typical in muscular torticollis than in osseous torticollis.

2. In osseous torticollis the sternocleidomastoid is not retracted but remains supple, while in congenital muscular torticollis the sternocleidomastoid is replaced by a retracted fibrous mass.

3. When the deformity of muscular torticollis is exaggerated easy movements are obtained and the spinal column appears to be supple, while in osseous torticollis the movements remain restricted laterally to a greater or less degree depending upon the degree of the deformity.

4. Finally one must remember that a torticollis appearing immediately or soon after birth is usually due to congenital muscular torticollis and only rarely to congenital occipitalization of the atlas.

Gaudier, H., and Swynghedauw, P.: Surgical Treatment of the Costal Gibbus as an Aid in the Orthopedic Treatment of Scoliosis (*Traitement sanglant de la gibbosité costale comme adjuvant du traitement orthopédique de la scoliose*). *Rev. d'orthop.*, 1921, viii, 265.

The costal gibbus of scoliosis is not due so much to the lateral deviation as to the rotation of the spinal column on its vertical axis. The ribs, fixed to the vertebral column at two points, participate in any movement of torsion of the spine and amplify it. Opposition to this movement by the sternal attachments causes acute angulation and flattening of the chest which reduce its capacity, mobility, and resiliency. Accordingly, it is very probable that the deformity is of great importance in rendering irreducible the vertebral deviation which caused it.

Subperiosteal resection of portions of the most prominent angles of the ribs should be reserved for those stubborn cases in which the child has passed the age of puberty and the deformity has resisted all other methods of orthopedic treatment. This operation helps to correct the deformity and by increasing the mobility of the spine renders possible subsequent correction of the spinal deviation. Two cases treated by this method were the following:

CASE 1. The patient was a girl 14½ years of age who had had scoliosis for two years. Between 8 and 10 cm. of the fifth, sixth, seventh, eighth, and ninth ribs on the affected (right) side were resected. Although after-treatment was prevented by scarlatina which was contracted shortly after the operation, the deformity almost disappeared, the scapula, which previously was very prominent, resumed its normal position, and the correction was later completed by the wearing of a cast with pressure obtained by means of squares of felt. The X-ray now shows the ribs largely restored in continuity by periosteal regeneration.

CASE 2. The patient was 15 years of age. The deformity dated back several years but had become more pronounced during the past two years. The

gibbus of the ribs was irreducible either by suspension or by flexion. Resection of portions of the sixth to the eleventh ribs was followed by uneventful convalescence except for slight fever on the second day. Three weeks later the transverse processes which form the only prominences on the involved side of the thorax were slowly corrected by pressure.

With regard to the technique of the operation the authors state that they make a large U-shaped skin flap with its base toward the back. In closing the wound allowance is made for temporary drainage and a Velpéau bandage is applied. In cases of mild kyphosis a cast is applied and pressure is exerted on the protruding parts through narrow windows.

JOHN W. BRENNAN, M.D.

Harrenstein, R. J.: *The Albee Operation in Tuberculous Spondylitis* (Ueber die Albeesche Operation bei Tuberkuloeser Spondylitis). *Nederl. Tijdschr. v. Geneesk.*, 1921, lxx, 2279.

The implantation of a bone graft into the affected vertebræ as a method of treating tuberculous spondylitis was first suggested by Albee. The tibial graft is wedged into the split spinous processes of the affected vertebræ and of those immediately adjoining it above and below, the object being to secure healing through fixation. This procedure has been generally accepted. Effective immobilization is thereby obtained and the patient is able to be up and about early after the application of a plaster-of-Paris jacket or other temporary support. The operation hastens the healing process, arrests the tendency to gibbus formation, and leads to cure.

There are, however, contra-indications. In the presence of a kyphos the application of the graft might render the later correction of the deformity impossible. Therefore, in such cases conservative measures should be used before an operation is attempted. Such conservative methods have been employed by Waldenstroem of Stockholm.

While the deformity may at times be partially corrected by the implantation, this is by no means always the case. A further contra-indication to this method is offered by the presence of an abscess anterior to the vertebræ. An abscess posterior to the vertebræ, however, did not deter Albee from the operation. Calot's theory that the opening of a cold abscess is very dangerous is justified.

A secondarily infected abscess and the signs of paraplegia are other contra-indications to the Albee procedure.

Anæsthesia is not always a simple matter in these cases. The induction of local anæsthesia is difficult in the cases of young children. Old persons who have serious complications are best treated conservatively.

KOCH (Z).

Cobb, S., and Coleman, C. C.: *The Course of Recovery Following Trauma of the Spinal Cord*. *Arch. Surg.*, 1921, iii, 132.

The authors have made a study of the course of recovery following injury of the spinal cord in

twenty cases admitted to U. S. Army General Hospital No. 11.

They noted that if no improvement was demonstrable in sixty days the outlook was unfavorable. Most of the patients who improved to any great extent began to show signs of recovery during the first forty days, and progressed rapidly during the next four months. Thereafter the condition remained comparatively stationary.

It was found also from this study that it is often impossible to classify spinal-cord injuries clinically with reference to the extent of the cord destruction as signs indicating the resumption of cord function frequently appeared later in cases regarded at first as hopeless. In view of this difficulty in determining early which are cases of complete anatomical transection and which are cases of œdema, hæmorrhage, and compression superimposed upon an incomplete lesion, it does not seem justifiable always to delay operation when there appears to be complete physiological interruption.

If operation is postponed until signs of recovery of cord function appear, additional damage to the cord may result. The residual condition then would be attributable in part to the failure to relieve the pressure effects by early decompression. Therefore it is probable that the conservatism in the treatment of severe cord injuries advocated by some surgeons should be modified. If the patient's general condition justifies an operation and there is reasonable doubt as to whether or not the cord is completely divided, an effort should be made to reduce or to prevent the later disabilities by prompt exploration of the injured cord.

FREDERICK CHRISTOPHER, M.D.

Lord, F. T.: *A Discussion of the Differential Diagnosis of a Case of Spinal Tumor*. *Med. Clin. N. Am.*, 1921, iv, 1799.

Lord reports the case of a woman 43 years of age who presented an interesting, important, and difficult diagnostic problem. The opinions of forty physicians with regard to the case are considered in the discussion. At the onset of her illness twenty-two months before, the patient stumbled and fell and had difficulty in raising her feet over the curbing. As the disturbance progressed there was increasing stiffness in the legs and ultimately such disability resulted that the patient was unable to stand without support.

Early in the course of the disturbance there was numbness with loss of pain and temperature sense in the left foot which gradually extended until almost all of the left leg became involved. On the right side numbness was confined to the region between the toes and the inner aspect of the leg. There was no history of pain but complaint was made of an uncomfortable dull ache in the upper lumbar region, a sense of constriction about the abdomen, and occasionally involuntary defæcation.

At examination the left pupil was found to be larger than the right. The deep reflexes of both

upper extremities were somewhat increased. The abdominal reflexes were absent. Both knee and Achilles jerks were exaggerated, the right knee jerk being greater than the left. Ankle and patellar clonus was present on both sides, the ankle clonus being greater on the right. The Babinski reflex was present on the right side only. At the first examination two months after the onset of the condition there was dissociation of sensory perception in the lower extremities, the sense of touch being everywhere unimpaired, while pain and temperature sense were diminished throughout the left leg, the left thigh, and the left gluteal region. Finally there was impairment of touch in both lower extremities and in the trunk as far upward as the lower border of the thorax and almost complete loss of temperature and pain sense on both sides as far upward as the nipples in front and the angles of the scapulæ behind. The gait was staggering and spastic. Motion of the legs was impaired, the flexors and extensors of the right leg being weaker than those of the left.

The Wassermann test on the blood and spinal fluid was negative. The spinal fluid showed eight cells with positive protein tests. The X-ray examination was negative.

In the discussion the importance of determining the evolution of symptoms in diagnosis in general and in neurological problems in particular is emphasized. Twenty of forty physicians regarded the condition as due to syphilis, thus by implication indicating a lack of faith in the reliable exclusion of syphilis by clinical and laboratory methods. The condition was diagnosed as a disturbance of the motor pathway by ten physicians, as ataxic paraplegia by seven, as tabes by six, as spinal tumor by five (two of whom recommended operation), as multiple sclerosis by three, as syringomyelia by three, as cerebrospinal or spinal syphilis by three, as syphilitic myelitis by two, and as a syphilitic growth by one.

The combination of symptoms, however, was almost wholly compatible only with syringomyelia or compression myelitis. Of the various possible causes of compression, the most probable was a slowly growing tumor. The clinical diagnosis was: (1) tumor of the cord (medullary) or (2) syringomyelia.

At operation Mixter found at the level of the fifth dorsal vertebra an irregularly lobulated tumor (fibrosarcoma) which was free except at the point of exit of the fifth right dorsal root. The dural sheath of the latter probably represented the site of origin of the growth.

Operation was followed by complete recovery. The patient reported eight years later that she had worked since her discharge and had not suffered even a backache.

Guleke: Two Rare Diseases of the Spinal Vertebra: Echinococcosis and Actinomycosis (Zwei seltene Wirbelerkrankungen: Echinococcus und Aktinomykose). *Deutsche Ztschr. f. Chir.*, 1921, clxii, 59.

Two cases of strikingly chronic course are reported:

CASE 1. The patient was a male 46 years of age. The cord was compressed at the level of the second and third thoracic vertebrae by a hard tumor, believed to be an osteosarcoma. This tumor extended out into the left supraclavicular fossa. Laminectomy disclosed numerous echinococcus cysts which had practically destroyed the first rib, encroached on the vertebrae, and invaded the spinal canal. Large foci were found also in the posterior mediastinum. Death followed from bronchopneumonia. The author warns against neglect of exploratory puncture in such cases.

CASE 2. The patient was a male 53 years of age. Between the chest wall and the scapula was a soft actinomycotic infiltration with pus showing characteristic sulphur granules. The process had spread to the posterior mediastinum, attacked the vertebrae as a superficial caries, and exerted pressure on the cord through granulations but did not cause paralysis. Five operations had been performed in five years but did not result in a cure although there was marked improvement. The weight-bearing capacity of the spinal column was not interfered with despite the removal of several transverse processes together with the corresponding arches. In the author's opinion the infection was probably contracted by handling the money of farmers. The primary focus was apparently in the upper lobe of the right lung and due to aspiration. This focus broke through into the mediastinum and extended backward while the lung healed completely. GRASHEY (Z).

SURGERY OF THE NERVOUS SYSTEM

Ney, K. W.: The Technique of Nerve Surgery. *Ann. Surg.*, 1921, lxxiii, 37.

During fourteen months in an army hospital the author had 1,500 peripheral nerve cases under his care. Three hundred of these were operated upon.

Local anæsthesia was used in every case, the line of incision being carefully injected and the operative area being deeply infiltrated with 1 per cent novocaine solution containing 15 drops of adrenalin solution (1:1,000) to each 30 c.cm. This, in great measure, eliminated the oozing and hæmorrhage usually present in the scar-invaded area.

Torsion of a nerve trunk during suture was considered a very serious occurrence and its prevention was regarded as essential for the ultimate success of nerve suture. Twisting of the nerve trunk effects a physiological misplacement of the fibers; sensory fibers may be directed down motor channels and motor fibers through sensory pathways, resulting in defective sensory return and diminution in motor restoration.

It is generally believed that a misdirected nerve fiber cannot re-educate itself to an entirely different function.

The prevention of torsion in nerve suturing may be attempted by several different methods or combinations of methods. No one method can be recommended to the exclusion of the others. Those employed in the author's cases were: (1) the use of identification sutures, (2) funicular or bundle matching, (3) forceps identification, (4) anatomical or striation markings.

The use of identification sutures consists in the placing of fine silk sutures in both segments of the nerve proximal and distal to the lesion and at a definite point in its circumference before it has been completely dissected from its bed. When the nerve is ready for suturing, the identification sutures are lined up so as to prevent twisting of the nerve trunk upon its axis.

Funicular or bundle matching has not been satisfactory because of the degeneration usually present in the ends of the severed nerve.

Forceps identification has been very successful because the forceps are readily adjusted and are of aid in holding the nerve for section and later for suture. Fine mosquito forceps were used to grasp the sheath on either side of the nerve trunk as it was lifted from its bed.

Anatomical markings are of value because the longitudinal markings in conjunction with the course of blood vessels often serve to reveal a twisting of the nerve trunk.

In cases of nerve defects the end of the proximal segment usually presents a neuroma but the end of the distal segment rarely reveals any enlargement. The bridging of the nerve defect was frequently a difficult matter in the cases under consideration, and was accomplished by one or a combination of the following methods: (1) primary stretching, (2) flexion relaxation, (3) transposition, (4) two-stage operation, (5) grafting.

Primary stretching alone will overcome a large number of defects, and is accomplished by freeing the nerve from the surrounding scar tissue, placing forceps on each of its ends, and drawing the ends together by exerting gentle pressure. It is believed that stretching does not interfere materially with the regeneration of the fibers.

Flexion relaxation is used in most cases and has proved to be of greater value than any other method of overcoming nerve defects. The nerve is relaxed by flexion of the governing joint. After the nerve ends have been approximated the limb is maintained in the flexed position by means of plaster or a special splint for four weeks. At the end of this time extension of the extremity is encouraged by permitting about 10 degrees of increased extension each day until the limb is fully extended.

The transposition of a nerve trunk from a deep to a superficial plane or vice versa, or from an extensor to a flexor surface, will assist materially in overcoming defects. The dissection of the nerve trunk must be carried some distance above and below before transposition of the nerve is possible.

The two-stage operation is used only for large defects which cannot be overcome by the ordinary methods just outlined. The first stage consists in exposing the nerve and applying the method of primary stretching in conjunction with the method of flexion, except that possibly the scar tissue and the neuroma are not removed but are used as stronger tissue through which the sutures are tied so that more tension will be possible. The wound is closed and the limb maintained in flexion for one week, after which time the apparatus is removed and extension is encouraged.

The second stage of the two-stage operation consists in again exposing the nerve, which by this time has become sufficiently elongated, and removing the scar tissue and neuroma. Suture is then performed and the limb is maintained in flexion in plaster for four weeks. The apparatus is then removed and extension is encouraged.

The success of nerve grafting depends upon the activity of the cells of the sheath of Schwann. Experience seems to indicate that the grafts should be homo-grafts, or better, auto-grafts. The author states, however, that in every case he subsequently removed the graft and repaired the nerve defect by the two-stage operative technique.

When scar tissue is present in large amounts an endeavor is made to transplant the nerve and obliterate the old bed. Frequently it is desirable to bring the nerve to a more superficial position where it is covered by only the subcutaneous fat which forms an excellent protection. Scar tissue will re-form in spite of everything that can be done and may be diminished only by perfect hæmostasis, a minimum of tissue trauma, and an aseptic technique.

Preparation of the nerve ends for nerve suture is accomplished by removing thin cross-sections until normal-appearing bundles are found throughout the sectioned end. The nerve is steadied by means of two or more fine forceps which grasp the nerve sheath firmly near the point of section. A safety-razor blade held by means of firmly applied forceps makes a very good instrument for nerve sectioning. The suturing is accomplished by means of eight fine silk epineural sutures. These penetrate the nerve sheath and to a slight degree the perifunicular connective tissue. Four sutures having been placed in the four quadrants of the nerve sheath, the identification forceps are removed and the intermediate sutures are placed between the quadrant sutures. When tension is encountered in overcoming a defect, a tension suture of No. 0 plain catgut is passed completely through the nerve. When all the epineural sutures have been placed and the governing joint has been flexed, the tension suture is drawn taut and tied. This having been done, the epineural sutures are tied and cut.

Neurolysis is directed toward the correction of cases of physiological interruption in which the anatomical integrity of the nerve has been preserved but function has been inhibited by one or a com-

bination of several factors, such for example, as external compression by scar tissue, bone callus, or any form of pressure; thickening or infiltration of the nerve sheath; and interstitial thickening. The nerve is freed from the compressing agent, and if there is still evidence of induration on palpation, the nerve trunk must be invaded. Where the sheath is found to be thickened, it is well to incise the latter and allow it to remain open, protecting the exposed bundles with a fat transplant.

G. H. MANKIN, M.D.

Fabry, F.: Clinical Contributions to the Problem of Paralysis of the Recurrent Laryngeal Nerve (Klinische Beitrage zur Frage der Recurrenslahmungen). *Ztschr. f. Ohrenh.*, 1921, lxxxi, 47.

Despite Semon's classic description of the nerve diseases of the larynx, many questions remain to be settled and new ones have arisen, such as the functional voice disturbances in the war-wounded, war injuries of the larynx, and the recent assertion of Riese that the posterior laryngeal nerve is innervated through the sympathetic nerves. For a clearer understanding of many questions a detailed report of numerous cases is necessary.

Fabry reports on the following 97 cases of paralysis of the recurrent laryngeal nerve: paralysis associated with goiter, 12; following thyroidectomy, 27; following trauma, 1; associated with pulmonary tuberculosis, 14; with aneurism of the aorta, 6; with aortitis, 2; with esophageal tumor, 2; with tumor at the base of the skull, 1; with multiple sclerosis, 1; with syringobulbia, 1; with syphilis, 2; cause unknown, 28.

In this series, which gives a good idea of the causes of the condition, the cases of paralysis associated with goiter and developing after thyroidectomy have a special surgical interest. The paralysis findings in cases of goiter give a good picture of paralysis of the recurrent and posterior nerves. In 3 cases the paralysis disappeared again spontaneously. In 1 case, in spite of complete paralysis of the vocal cord edges, there was a normal singing voice, a fact which contradicted Grossmann's contention that the normal vocal cord is unable to approach the paralyzed cord beyond the middle line. One of the cases treated was perhaps a case of strumitis. The adductor group recovered, but the cases of posticus paralysis did not.

The fact that vocal cord paralysis may develop spontaneously in goiter proves that paralysis is not necessarily the result of a surgical operation. Eight of 14 patients with postoperative paralysis of the vocal cord who were re-examined had a clear voice with slight roughness only occasionally. Recovery was effected, with occasional relapses, in from half to a whole year. In one case there was pre-operative, vocally compensated paralysis of the recurrent nerve. This compensation was temporarily disturbed by thyroidectomy, possibly through injury of the normal nerve. In 3 cases operated upon the vocal result remained unsatisfactory following unilateral paral-

ysis. Worthy of note were 3 cases of bilateral vocal cord paralysis in which, some time after operation, a serious dyspnoea developed. Tracheotomy was followed by improvement in both the dyspnoea and the voice.

The fact that sometimes only the posticus fibers were affected and sometimes the entire recurrent nerve was involved is explainable on the ground that the causative factor was not a partial section but a perineural extravasation which later caused permanent damage to the nerve through scar-tissue pressure.

Paralysis of the recurrent laryngeal nerve is frequently a premonitory symptom of serious general disease such as syphilis, tuberculosis, malignant tumor, or disease of the aorta. Iodine treatment is of value in doubtful cases and may cause the symptoms to clear up. In other cases vibratory massage and exercises are beneficial. Bruening has found paraffin injections of value. Payr recommends a plastic operation on the thyroid cartilage.

KULENKAMPPF (Z).

Wiedhopf: The Freezing of Transverse Nerve Sections in the Treatment of Pain, Especially in Recent Amputation Stumps (Die Vereisung des Nervenquerschnittes zur Behandlung von Schmerzzuständen, besonders an frischen Amputationsstümpfen). *Beitr. z. klin. Chir.*, 1921, cxxiii, 158.

Wiedhopf reports the results of freezing transversely sectioned nerve ends in 15 cases at the Marburg clinic. The freezing was done on account of pain from a neuroma in 1 case, to prevent pain at the line of demarcation of arteriosclerotic gangrene in 1 case, and in 13 cases of amputation. In the case of arteriosclerotic gangrene a perfect transverse paralysis of the nerve was obtained by the freezing but it did not persist. The reason for the failure was not evident. Neurological examination showed that perfect organic interference had been obtained.

Freezing of the nerve ends, including the cutaneous nerves, was done in cases of recent amputation for three reasons: (1) to reduce the postoperative pain; (2) to reduce wound pain, especially in cases of sepsis; and (3) to prevent the formation of painful stumps. The literature shows a great variety of procedures for the last complication mentioned. Recently Gretzel of Hamburg has described a method in which the nerve trunk and all the cutaneous nerves were frozen about 5 cm. proximal to the line of transverse section for ten to twenty minutes and the nerve trunk was buried in the muscular tissue according to Moszkowicz's technique. As five cut nerve ends can be frozen simultaneously, the time of operation is not much increased and it is very probable that by this method most stumps may be rendered painless. Moreover, the implantation of the nerve stumps into the muscle tissue prevents neuroma formation and adhesions of the nerves to the amputation wound. Freezing has

a favorable effect also on postoperative pain and wound pain.

The beginning of the freezing is very painful. Its effects extend for about 4 cm. above the frozen area. The results, as shown in experimentation, depend upon the duration of the treatment but the author has not been able to determine any gradation scheme.

There is only one difference, which however is an important one, between the section and freezing of a nerve. In freezing there is an ultramicroscopic splitting which experiments and clinical cases have shown is almost certain to be followed by regen-

eration. This method may be used also in the treatment of neuritis, the temporary quieting of the diaphragm in cases of hiccough and pulmonary tuberculosis, or the operative closure of a diaphragmatic hernia.

The period of regeneration of frozen nerves differs according to the extent of the degenerated section but is given as about five to eight months, which is further proof that even following primary nerve suture restoration of nerve conduction is not possible in one or two days or even in a period of weeks.

CREITE (Z).

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Stokes, J. H., and Scholl, A. J., Jr.: A Case of Probable Paraffin-Oil Tumor. *Arch. Dermat. Syph.*, 1921, iv, 50.

The authors report a case of probable paraffin-oil tumor observed at the Mayo Clinic which had a number of characteristics of both a paraffinoma and tuberculosis. A feature of the clinical picture suggestive of tuberculosis or malignant neoplasia was the chains of nodules following the course of the lymphatics toward the axilla and elbow.

Biopsy revealed innumerable "tubercles" consisting of dense whorls of epithelioid cells and many giant cells (Figs. 1 and 2). Vacuolation with beginning fibrous encapsulation of the oil was apparent; thick frozen sections stained with Sudan III showed these vacuoles to be filled with a pale yellow material which could be readily distinguished from the deep orange stain of human fat (Figs. 3 and 4). Two guinea-pigs inoculated with portions of the tissue showed no tuberculosis.

The history of the case was very deceptive. Eighteen months before coming to the Clinic the patient had had influenzal pneumonia and was unconscious for about twelve hours. In all probability he received the oil hypodermically during this time. A week before the present lesion appeared he cut his hand on a cow's horn and a pyogenic infection ensued with involvement of the regional lymph nodes and much swelling. This course is typical of paraffinoma. The disease in most cases does not appear until some disturbance of the local circulatory equilibrium sets in, such as would be caused by an extensive pyogenic infection. Under such conditions the granulomatous and foreign-body reaction occurs.

As part of the clinical evidence against tuberculosis was the fact that inoculation with tuberculosis in the skin produces a tuberculous lesion at the site of inoculation in addition to the metastatic involvement, and that this metastatic involvement is of the regional lymph nodes rather than of the tissues at large. In this case there was no sign of tubercle of the scar from the trauma.

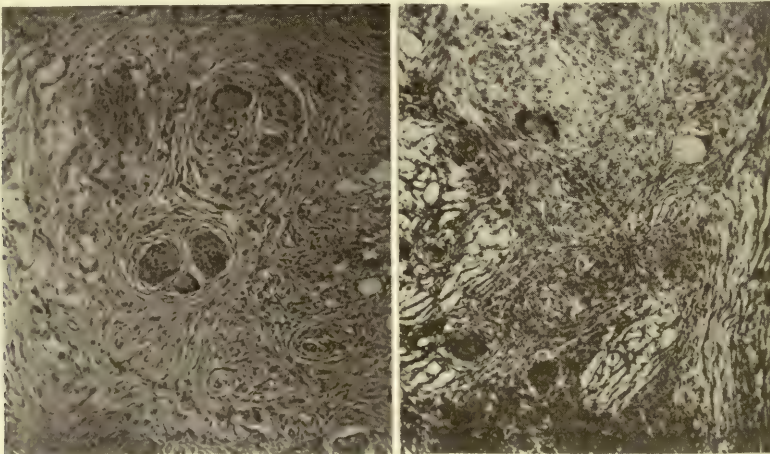


Fig. 1 (at the left). Pseudo-tubercles with giant cells; paraffin section.

Fig. 2. Granulomatous structures of tissue; oil vacuoles and pseudo-tubercles.

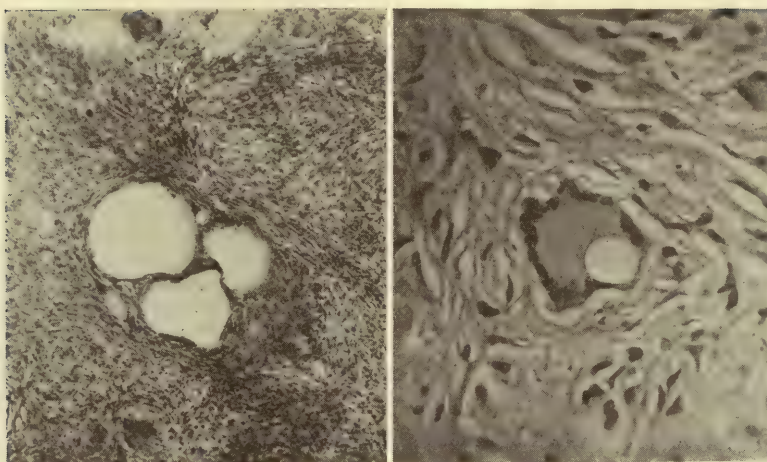


Fig. 3 (at the left). "Swiss cheese" appearance due to encapsulated paraffin oil. Frozen section stained with Sudan III.

Fig. 4. Giant cell enclosing vacuole.

The treatment employed consisted of the application of wet dressings for a period of time in order to favor the transition from the inflammatory to the quiescent phase. When the tumid induration and purplish discoloration had disappeared an extensive surgical excision of the affected tissue was performed. The tumid area was allowed to granulate and skin grafting was done. The therapeutic result so far has been satisfactory.

These tumors result from the substitution of an inexpensive mineral oil for the olive oil usually employed as a vehicle for the suspension of camphor. They appear from one to eighteen months after the injection of the oil, often not developing until there is some disturbance of the local circulatory equilibrium.

MacCarty, W. C., and Mahle, A. E.: *The Relation of Differentiation and Lymphocytic Infiltration to Postoperative Longevity in Gastric Carcinoma.* *J. Lab. & Clin. Med.*, 1921, vi, 473.

In a report of 200 cases operated on at the Mayo Clinic in 1912 MacCarty made some general observations as to the relation of regional lymphatic glandular involvement to postoperative longevity in gastric carcinoma. The main facts disclosed were that gastric carcinoma with glandular involvement occurs in younger persons than gastric carcinoma without glandular involvement; that the loss in weight is directly proportional to the glandular involvement; that the size of the regional glands has no relation to the size of the primary lesion in the stomach; that the duration of clinical symptoms bears no apparent relation to the extent of the glandular involvement; and that both the immediate postoperative and subsequent mortality are in direct proportion to the amount of glandular involvement.

Eight years later another investigation was made as to longevity. Only those patients were considered whose specimens were still in a state of perfect preservation. This series numbered ninety-nine. The studies show that persons with no glandular involvement have a much greater average length of postoperative life than those with glandular involvement; that no person with glandular involvement lives over eight years; that the average age of persons with complete glandular involvement is five years younger than that of those without glandular involvement; that the average length of postoperative life is greater between 29 and 40 and 60 and 72 years of age than that at other periods; and that the younger the host the shorter the life expectancy after resection for gastric carcinoma, regardless of glandular involvement.

In spite of the fact that the length of life after operation is in inverse proportion to the degree of glandular involvement, there was a sufficient number of exceptions to demand further investigation and the results of this study constitute the body of the present article. One patient lived over five years and one over nine years after operation, in spite of complete glandular involvement. It was found that there are at least two factors contributing to longevity in these cases which can be studied with a fair degree of accuracy, that is, cellular differentiation and lymphocytic infiltration.

The power of cellular reproduction is in inverse relation to the degree of cellular differentiation unless the differentiation is for the specific purpose of reproduction. By the term "differentiation" is meant structural change for specific function. The cells of carcinoma sometimes attempt differentiation, and it has been thought that this might be seen in patients who live unexpectedly long after gastric resection. The specimens were therefore studied

from this standpoint. The other factor studied was lymphocytic infiltration.

It was shown that persons without glandular involvement and with differentiation had a life 14 per cent longer than that of persons without glandular involvement and without differentiation; that in persons with complete glandular involvement differentiation was not associated with increased longevity; that differentiation was more frequent in association with glandular involvement than without; and that differentiation was most frequent between the fortieth and fiftieth years of age, and least frequent between the twenty-ninth and fortieth years of age.

As to lymphocytic infiltration, it was found that cases of gastric carcinoma without glandular involvement but with extensive lymphocytic infiltration have the greatest average length of postoperative life. Regardless of glandular involvement, the presence of lymphocytic infiltration is associated with a 23 per cent longer postoperative life. Extensive lymphocytic infiltration is more frequent in association with glandular involvement than without. Regardless of glandular involvement, extensive lymphocytic infiltration is most frequent between the ages 40 and 50 and 60 and 72.

Patients with gastric carcinoma with the combination of lymphocytic infiltration, differentiation, and no glandular involvement live 150 per cent longer than patients without differentiation and lymphocytic infiltration. Patients with glandular involvement live 146 per cent longer when there is lymphocytic infiltration than when there is none. Patients without glandular involvement but with lymphocytic infiltration live 124 per cent longer than those without. The average length of postoperative life of patients with differentiation and lymphocytic infiltration combined is 82 per cent greater than that of those without differentiation and lymphocytic infiltration combined.

O. S. PROCTOR, M.D.

Crile, G. W.: Studies in Exhaustion. II. Exertion.
Arch. Surg., 1921, iii, 116.

Crile studied the Purkinje cells in the brains of foxes after different lengths of chase and made differential counts of these cells in dogs after fights and other forms of muscular exertion. He studied also the effects of anger combined with exertion on dogs and cats, and of continuous exertion (forced swimming) on rats. In addition, he compared the brains, livers, and suprarenals of salmon caught at the mouth of the Columbia river with those caught at the headwaters of the river after they had had an exhausting 700-mile swim without food. The effect of exertion on the electric fish was studied by means of the galvanometer. In order to determine the effect of exertion on the chemical contents of certain organs and tissues, he analyzed various glands and tissues from eight normal cats and from the same number of cats which had struggled against restraint for four hours. The conclusions drawn are as follows:

1. Extreme physical exertion in various land animals and in fish causes demonstrable histologic changes in the central nervous system, the liver, and the suprarenals. These changes, which are least marked in the liver, are identical in character with those already recognized as due to prolonged insomnia.

2. The discharge of the electric mechanism in the electric fish causes histologic lesions in the brain, the liver, and the suprarenals.

3. Chemical studies made after animals had been subjected to extreme exertion show an increased iodine content of the thyroid and a slightly increased glycogen content in the liver, a diminished glycogen content in the muscles, a greatly diminished epinephrin content, and a diminished epinephrin activity.

4. The hydrogen-ion concentration of the blood and urine is increased by extreme exertion.

5. The clinical effects of exertion as immediately manifested in increased temperature, pulse, and respiration, and later in acute or chronic exhaustion, are self-evident.

FREDERICK CHRISTOPHER, M.D.

Binet, L., and Dubois, G. J.: The Function of the Ileocecal Appendix (Le rôle de l'appendice iléo-cæcal). *Presse méd.*, Par., 1921, xxix, 625.

The authors review the research which has been done to establish the physiological functions of the ileocecal appendix. The toxicity of extracts of the organ has been established, and it is known that the appendix possesses a motor function as it is able to force foreign bodies which enter it back into the cæcum. It is particularly a secretory organ, however, as it has a digestive secretion, a secretion to eliminate bacteria, and an internal secretion.

With regard to the function of the appendix as a digestive gland the experimental work of Roger and Josué has shown that the rabbit appendix secretes an abundant, clear, and viscous alkaline fluid which is not bactericidal. This has an amylolytic power but has no effect on fibrin or saccharose. These authors believe, therefore, that its function is to lavage the appendix. From studies of healthy and diseased human appendices made by Robinson, Hartman, Binet, and others it would appear that the secretions of the organ have a distinct, though slow and only partial, digestive action on the proteins and a very slight effect upon the carbohydrates. MacEwen found that when the intestinal contents pass through the ileocecal valve the cæcal and appendiceal secretion is abundant.

With regard to the appendix as an eliminator of bacteria the animal experiments of several authors demonstrate that when injections of micro-organisms are made into the veins of rabbits appendicular lesions very commonly develop. Therefore it is known that general infections are reflected in the appendix. However, if there is elimination of bacteria by this organ, if bacteria pass from the circulation into the appendix, it appears that a current in

the opposite direction is produced. Masson and Regaud found that in the rabbit the bacteria penetrate the appendicular lymphoid tissue toward the end of the second week of extra-uterine life and at the end of the fifth week have reached the middle portion of the fundus of the follicles.

With regard to the appendix as a gland the authors state that it is so rich in lymphoid tissue it has been termed the "abdominal tonsil." Its ability to produce lymphocytes is therefore very great. Recently attention has been drawn to the fact that besides this lymphoid tissue there is a glandular tissue analogous to that of the blood vascular glands. According to Masson, cells which color gray or black in ammonia are to be found throughout the small and large intestines and in the appendix. Together, these form a diffuse endocrine gland which is the homologue of the islets of Langerhans in the pancreas. The physiological function of these elements is not known. It is possible that in pathological conditions they may be connected with certain tumors of the appendix.

W. A. BRENNAN.

SERA, VACCINES, AND FERMENTS

Lambret, O.: Two Cases of Vaccine Therapy for Pleural Suppuration (Deux observations de vaccinothérapie pour suppuration pleurale). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 909.

The author reports the histories of two cases of pleural suppuration treated with vaccine. The first was an old staphylococcal purulent pleurisy. The patient had been operated upon but a fistula persisted. Following treatment with autogenous vaccine the pleural cavity became completely sterile so that further operative treatment, consisting of resection of ribs, decortication of the lung, and obliteration of the fistulous tract, was done without complication. The patient made a rapid recovery.

The second case was a revolver bullet wound in the chest in which a pleurotomy had been done but an infected hemothorax persisted. This condition also was rapidly cured by means of autogenous vaccine.

The author states that before pleural operations are performed in infected cases it is the custom to try to obtain sterilization by a preliminary exploratory thoracotomy. He believes that in favorable cases vaccine therapy will make this intervention unnecessary.

W. A. BRENNAN.

BLOOD AND LYMPH VESSELS

Hill, L.: Capillary Pressure and Oedema. *Brit. M. J.*, 1921, i, 767.

In numerous determinations on cold-blooded and warm-blooded animals the author found the capillary pressure to be low, equaling 2 to 7 mm. of mercury. A modification of the Roy and Brown method was used, the reading being made at the point where the capillaries become narrowed but not obliterated. Hill argues that obliteration must raise the pressure as in the arteries. He believes the usually accepted capillary pressure of 20 to 30 mm. is far

too high and that in reality this pressure is so low as to be negligible as a cause of oedema.

Oedema is considered to be the result of imbibition of water into the cells outside of the capillary wall due to insufficiency of oxygen. When pressure is made on an artery the capillaries dilate and the cells imbibe water to keep the capillary pressure up, for if the cells swell the capillary is pressed on and narrowed, the venules are narrowed, and the capillary pressure is raised.

The author has noted the disappearance of oedema and the healing of ulcers brought about by means of a tent bed which allows the patient to breathe in comfort 30 to 40 per cent oxygen for some days.

The escape of white cells during stasis and of red cells following severe injury shows pathologic permeation of the capillary wall, but normally the tissue cell, not the capillary pressure, governs the passage of fluid.

C. E. BAKER, M.D.

Dobrovolskaia, N.: A Characteristic Symptom of Arteriovenous Aneurisms (Sur un symptôme caractéristique des anéurismes artério-veineux). *Lyon chir.*, 1921, xviii, 300.

Dobrovolskaia states that arterial pressure above an arteriovenous aneurism causes immediately a pronounced slowing of the pulse, a diminution of about 40 beats, while compression of the corresponding artery on the normal side has no influence on the pulse rate. As arterial aneurisms do not show this phenomenon it is of value in the diagnosis. This variation is the sign of more or less marked change in the heart of which the arteriovenous aneurism is the cause. When the aneurism is repaired the phenomenon completely disappears.

Slowing of the pulse after compression of the proximal end of the artery was observed by Israel in a patient with an angiectasis of the anterior tibial artery and by Katzenstein in a case of circoid aneurism of the forearm. When the artery is compressed above an aneurism an increase in the blood pressure has been observed.

W. A. BRENNAN.

Sloan, H. G.: Successful End-to-End Suture of the Common Carotid Artery in Man. *Surg., Gynec. & Obst.*, 1921, xxxiii, 62.

Sloan reports a successful end-to-end suture of the common carotid artery wounded in an operation for recurrent carcinoma of the glands of the neck. The patient was a man 56 years of age with arteriosclerosis. The carotid artery had become embedded in fibrous tissue following resection of the jugular vein.

The Carrel technique was used with guy sutures. Three days after the operation full pulsation in the temporal artery was noted and the patient made an uneventful recovery.

H. A. MCKNIGHT, M.D.

Griffith, J. P.: Saphenoperitoneal Anastomosis for Ascites Due to Cirrhosis of the Liver. *Therap. Gaz.*, 1921, xlv, 457.

The author reports eight cases of saphenoperitoneal anastomosis for ascites in cirrhosis of the liver.

The ideal or selected case for this operation is the case of alcoholic cirrhosis with minimal cardiorenal involvement.

The operation can be done with impunity, lends itself readily to local anæsthesia, and causes little or no shock. The technique is as follows:

An incision is made over the course of the saphenous vein, beginning 1 in. above the saphenous opening and extending down the thigh for a distance of 8 or 9 in. The vein is then dissected free an equal distance and the collateral branches are ligated close to the lumen of the vein to prevent possible thrombosis.

A second incision is made above the external ring in the direction of the fibers of the external oblique muscle. The liberated saphenous vein is brought up through the subcutaneous tissue to the site of the anastomosis to the peritoneum by making a pathway with a blunt instrument, preferably a uterine sound.

The vein is cut flush and its lumen washed out with normal saline solution. Three incisions equal distances apart are made along the long axis of the vein from the cut end for a distance of 1 cm. to form three flaps for the end-to-side anastomosis with the peritoneum.

The peritoneum is clamped to prevent leakage, a cone being left between the clamps, and the apex of the cone-shaped projection is cut flush. In this manner a circular opening is formed for the apposition of the vein flaps. The three flaps of the veins are then sutured to the circular opening with fine silk.

H. A. MCKNIGHT, M.D.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Schlaepfer, K.: Intrapleural Reflexes and Their Significance in Operative Procedures (Die intrapleurale Reflexe und ihre Bedeutung bei operativen Eingriffen). *Ergebn. d. Chir. u. Orthop.*, 1921, xiv, 797.

It can be proved experimentally that there are sensitive elements in the costal pleura the mechanical or chemical irritation of which causes general protective movements. During faradic stimulation clonic contractions occur in the upper extremity of the same side. Faradic stimulation of the pulmonary or mediastinal pleura produces no contractions. Stimulation of the diaphragmatic pleura with the faradic current produces local contractions of the diaphragm. In faradic stimulation of the parietal pleura adjacent to the diaphragm contractions take place in the upper and lower extremities. In faradic stimulation of the parietal peritoneum contractions occur in the abdominal musculature and in both lower extremities, stronger on the same side. Stimulation of the peritoneum covering the diaphragm produces contraction of the diaphragm only. The visceral peritoneum is insensitive to electrical stimulation.

The vagus fibers running longitudinally carry centripetal pain sensations which, after chemical

irritation of the pleural cavity by diffusion of the substance beneath the pleura pulmonalis, cause defensive contractions in the upper extremity on the same side. Resection of the vagus in the neck inhibits these contractions. Stimulation or paralysis of the sympathetic nerve then has no further influence. Wever has shown in experiments on the monkey that the cerebral irritation and paralysis noted in the so-called intrapleural reflexes can be produced by air embolism. The marked variability in the clinical picture in such cases of embolism is dependent upon the number and extent of the brain centers affected. The picture is identical with that of cases of air embolism occurring in pneumothorax therapy. The so-called intrapleural reflexes in the different operations on the thorax (aspiration, irrigation, artificial pneumothorax, sounding of empyemic cavities, changing of drains, thoracoplasty, and pneumotomy) are due to very small air emboli in the pulmonary veins. As the result of injury of a branch of the pulmonary vein in chronically inflamed and therefore indurated lung tissue the blood from the central portion of the injured vessel is aspirated with air by a nearby larger pulmonary vein of normal or nearly normal circulation. In rare cases there may be absorption of bismuth emboli from an empyemic cavity due to the temporary increase in pressure. In pneumothorax treatment the gas may be forced into a vein. From this group of cases we must exclude cases of pulmonary embolism following thrombosis in the lower extremities and the pelvis, and cases of pulmonary thrombosis with cerebral embolism, both of which begin with similar clinical symptoms. We must exclude also cases of latent heart injuries and adrenal insufficiency which lead to sudden death, and the cases of patients who have been ill for a long time and are therefore very weak. The reflex paralysis following gunshot wounds of the thorax is always due to an indirect mechanical injury of the brachial plexus. In the cases of patients with unstable nervous systems and in a weak general condition transitory collapse may be caused by abnormally severe pain in the costal pleura.

The severity of the clinical picture of so-called intrapleural reflexes is dependent upon the size and number of the areas affected by the emboli. Many of the disturbances pass away entirely if their rapid development does not cause death. The most severe phenomena, of course, last longest. Even high-grade changes retrogress entirely after a few months. Amaurosis disappears within a period of hours or days. The same is true of paralysis. In the more severe non-fatal cases there remains at the most a weakness in the limbs which have been paralyzed longest.

If air embolism develops the operation must be interrupted immediately: in pneumotomy tamponade should be done. The use of differential pressure decreases the negative pressure in the pulmonary veins and their ability to aspirate. In order that the head may not be flooded with air vesicles in case of

air embolism it should be so placed that it is not the highest part of the body. To force blood through the brain, stimulants should be employed, especially adrenalin intravenously. Under certain circumstances venesection (Jessen) is indicated to improve the circulation. Artificial respiration is contraindicated because of the danger of further embolism. When respiration ceases resort should be had to traction upon the tongue and faradic stimulation of the phrenic nerve. Morphine is to be avoided on account of its depressing effect upon the respiratory centers.

STAHL (Z).

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Meyer, A. W.: An Experimental Study of Muscle Contractures Following Fixation Dressings: Experiments on Cold-Blooded Animals (Experimentelle Untersuchungen ueber Muskelcontractur nach fixierenden Verbaenden; Versuche an Kaltbluetern). *Deutsche Ztschr. f. Chir.*, 1921, clxii, 122.

The study reported was made on 200 frogs. A leg was dressed in extension. One series of experiments was run on frogs kept in cold water and another on frogs kept in water heated to between 22 and 29 degrees C.

In the first series flexor contractures (quadriceps, gastrocnemius, etc.) were noted within fourteen days. These were very transitory, however, disappearing rapidly after the removal of the dressing. When the plexus was cut there were no contractures even after a period of weeks. When the lower leg was fractured contractures appeared very rapidly (within five days) and in muscles distant from the site of the injury.

In the second series of experiments progressively increasing contractures were easily discernable within ten days. When the dressings were removed and the frog was kept in warm water the contracture disappeared only after weeks, but when the frog was kept in cold water it disappeared within a few days. The same result was obtained when the plexus was cut except that the contractures in the warm-water frog which disappeared after the removal of the dressing and the transference of the frog to cold water appeared again when the frog was returned to warm water. When the leg was fractured the contractures occurred very rapidly.

Fixation contractures in cold-water frogs are dependent upon the innervation and are exaggerated if the leg is fractured. In warm-water frogs they occur independently of the nervous system, being due to thermal irritation.

SIMON (Z).

Rous, P., and McMaster, P. D.: The Concentrating Activity of the Gall-Bladder. *J. Exper. M.*, 1921, xxxiv, 47.

The experiments reported by the authors were undertaken as the result of observations upon stasis bile collected after ligation of the common duct. The accumulation of pigment in such bile seemed to indicate that some part of the duct system posses-

ses a concentrating faculty of considerable importance as regards pathologic processes.

In this article only the influence of the gall-bladder upon the bile is discussed.

The best method of study is one whereby a bile of known constitution is supplied through the normal channels to an intact gall-bladder by the animal's own liver. This is practicable in the dog because of the arrangement of the ducts. The common duct of the dog is formed as a rule by the union of three large channels, and the gall-bladder empties high up in the middle one. By means of a single ligature properly placed a type sample of bile can be diverted for separate collection, while the remainder flows to the bladder.

As a result of such a study it was found that the bile coming at one time from different portions of the liver of the dog has nearly the same amount of pigment per cubic centimeter. Using as a standard the pigment strength of a sample collected throughout the period of experiment from a duct branch, both the degree and the rapidity of the concentration were found to be remarkable. A gall-bladder emptied at the beginning of one experiment and left to fill from the liver concentrated the 49.8 c.cm. of bile reaching it in twenty-two and a half hours to 4.6 c.cm., that is to say, reduced its bulk 10.8 times, while another bladder left distended with bile of known constitution and receiving in addition fresh increments from the liver concentrated the secretion 8.9 times in twenty-two hours. A series of five emptied bladders concentrated the bile coming to them in about twenty-four hours on an average 7.1 times, or a little more than the 6.4 times of seven organs left full. The conditions in both cases were relatively unfavorable to the withdrawal of fluid from the bile because this takes place by osmosis and diffusion and the secretion in the animals was notably rich in solids as an indirect result of the operation.

The rapidity with which fluid is withdrawn through the wall of the bladder may be judged from experiments in which a bag was connected with the tip of the organ by a large cannula. Merely in its passage through the bladder the bile was concentrated from 2.3 to 4.8 times. This finding indicates a potential source of error in observations upon samples of bile obtained from fistulous channels of which the bladder forms a part.

The bile ducts do not withdraw fluid from the secretion they convey but tend to dilute it. The restriction of the concentrating activity to the receptaculum chyli indicates that the latter is of special importance to the organism.

G. E. BEILBY, M.D.

Rous, P., and McMaster, P. D.: Physiological Causes for the Varied Character of Stasis Bile. *J. Exper. M.*, 1921, xxxiv, 75.

The authors have found that the character of the fluid encountered at operation in the obstructed bile passages of human beings is varied. Even in cases

free from infection all gradations may be found between a black, tarry material and the watery, colorless "white bile" which has long puzzled surgeons. The causes for this variation are not immediately evident in clinical cases because of the numerous complicating factors which give to each an almost individual character. One looks in vain for a clue to them in such a book as that of Kehr which describes in detail the findings in many hundred operations upon diseased bile passages, but they are readily ascertained by experiment. With the exception of infection, the different, and in general, opposed, functions of the gall-bladder and ducts are principally responsible for the protean character of stasis bile.

The authors' experiments were performed on dogs, cats, and rhesus monkeys, but chiefly on dogs. Many animals used for concurrent observations regarding other subjects of investigation were available. Obstruction to the bile ducts was produced by tying and cutting, with excision, when possible, and at difficult points by means of ligatures laid on in series. In dogs and cats the danger that the continuity of the passage would be restored by the cutting through of the silk thread was found to be negligible if heavy silk was used. The operations were performed aseptically under ether anaesthesia, and the abdominal wound was closed in three layers. Infection and other complications were rare.

It was found that whenever an obstructed bile duct was left in communication with the gall-bladder the stasis bile was heavily pigmented and syrupy, ropy, or tarry, according to whether the period of obstruction had been short or long.

From the results of these experiments the following conclusions are drawn:

The gall-bladder and ducts exert opposite influences upon the bile. The ducts do not concentrate and thicken it with mucus as the bladder does, but dilute it slightly with a thin secretion of their own that is colorless and devoid of choleates even when the organism is heavily jaundiced. The fluid may be readily collected in a rubber bag connected with an isolated duct segment. It continues to be formed against considerable pressure, and in the dog is slightly alkaline to litmus, clear, almost watery, practically devoid of cholesterol, and of low specific gravity to judge from the one specimen tested. In obstructed ducts separated from the gall-bladder or connecting with one so changed pathologically that its concentrating power has been lost, such fluid gradually replaces the small amount of bile originally pent up. This is the so-called "white bile."

When obstructed ducts connect with an approximately normal gall-bladder the stasis fluid is entirely different because of the bladder activity. At first there accumulates in quantity a true bile much inspissated by loss of fluid through the bladder wall, darkened by a change in the pigment, and progressively thickened with bladder mucus. As time passes

the duct secretion mingles with the tarry accumulation and very gradually replaces it. The inspissation of the bile, as indicated by the pigment content, is at its greatest after only a day or two of stasis.

The differing influences of the ducts and bladder upon the bile must obviously have much to do with the site of origin of calculi and their clinical consequences. The concentrating activity of the bladder must be a potent element in the formation of stones. Intermittent biliary stasis is admittedly the principal predisposing cause of cholelithiasis, and the stasis is to be thought of as effective, in many instances at least, through the excessive biliary inspissation for which it gives opportunity. In this way a normal gall-bladder may become a menace to the organism merely through functional activity. In patients with a tendency to stone formation frequent feedings may lessen the danger.

GEORGE E. BEILBY, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Phemister, D. B.: *Studies in the Reduction of Bone Density.* *Am. J. Roentgenol.*, 1921, n. s. viii, 355.

This article deals only with reduction in density produced by bone absorption. The direct action of fixed cells known as osteoclasts is responsible almost entirely for such absorption. Osteoclasts may be abnormal cells, as in tumors or inflammation, or may arise from alteration in function of cells in the vicinity which may remain without change in form or may be transformed into giant cells. The process is probably the result of the creation of an acid medium in direct contact with the bone which causes its solution. Different histologic pictures arise from the process, such as pocket formation or smooth absorption. Reduction in density may be local, regional, or general, according to the cause. In most local processes there is both local and regional reduction in density, and if general symptoms are marked, extend over a long period of time, and confine the patient to bed, there may be general reduction in density.

In bone infections there are four processes by which reduction in density may be produced: (1) destruction of dead bone at the site of greatest inflammatory activity; (2) local destruction of living bone, or caries; (3) rarefying osteitis in the neighboring living bone for variable distances about the area of complete bone destruction; and (4) regional atrophy due to disuse. The amount of each of these forms varies considerably with the nature and severity of the inflammatory process, and is of considerable importance in the differential diagnosis of inflammatory bone changes. Detailed descriptions are given of the changes produced in osteomyelitis, tuberculosis, and syphilis of bone.

Reduction of density in bone tumors results almost entirely from the breaking down of living

bone by cellular activity. However, aseptic dead bone may occasionally be seen where portions of cortex are cut off and completely surrounded by tumor which undergoes necrosis. Regional atrophy may arise from disuse when the tumor causes pain and great loss of function. Bone destruction reducing density is accompanied by extremely variable amounts of new bone formation, and the extent and distribution of the two processes must be taken into consideration in determining the nature of the lesion.

The changes occurring in metastatic carcinoma, sarcoma, central giant-cell tumors, and cysts are described at length.

In Perthes' disease, the reduction in density is due to the breaking down of the center of ossification in the epiphysis of the femoral head. This leads to secondary flattening of the head and alterations in the shape of the acetabulum and neck. Grossly and microscopically one case studied in detail by the author showed findings resembling those of a quiescent focus of localized pyogenic infection.

A case of congenital venous aneurism of the arm showed extensive osteoporosis of the radius and ulna, the cause of which was rather problematic. The condition may have been due to the venous congestion and consequent acidosis resulting from an increase of the carbon dioxide content of the blood. This would augment the solubility of the lime salts and favor absorption. Similar osteoporosis has been observed in cases of enlargement of an extremity due to congenital elephantiasis.

The article is copiously illustrated with roentgenograms and photomicrographs.

ADOLPH HARTUNG, M.D.

Soiland, A.: Radiation and Thyroid Disease.
J. Radiol., 1921, ii, 19.

Toxic goiter is associated with abnormal cell functioning and since radiation has a potent effect in inhibiting such activity, its use is strongly indicated in the treatment of this condition. Many factors must be considered, but as a rule the modern deep radiotherapy, pushed as much as possible, is the proper procedure. It makes very little difference whether the roentgen ray or radium is employed; in the author's experience both give equally good results. The simplicity of radium as compared with the complicated roentgen-ray apparatus is of particular advantage, however, in the cases of very nervous patients. Also in the soft cellular enlargements radium seems to act better than the roentgen ray, but in the hard fibroid types the roentgen ray is preferable. There are some conditions in which both agents may be successfully combined.

In the average case of toxic goiter three X-ray treatments in three weeks are given through each of six portals of entry, four over the thyroid and two over the thymus region, for 35 ma. minutes, with

4 mm. of aluminum and a $\frac{1}{2}$ in. cotton filter, under compression, at an 8-in. skin distance and 10-in. back up. This is usually sufficient to control the symptoms, and the patient returns in sixty days for inspection. In radium cases, 100 mg. of radium element are used for each portal for four hours, with $\frac{1}{2}$ mm. of silver and 2 mm. of hard rubber filter at a $\frac{1}{2}$ in. skin distance. This is repeated in ten days, after which period the patient reports in sixty days. A very few cases of hypothyroidism have been observed when fairly good results followed a few light exposures for the stimulating influence on the gland.

The author has treated about 200 cases of toxic goiter by radiation, 70 per cent by roentgen therapy alone, 20 per cent with radium only, and 10 per cent with a combination of both. Conservatively stated, the results have been gratifying. He believes that in radiation we have a proved therapeutic agent far superior to any other available at the present time.

ADOLPH HARTUNG, M.D.

Lyons, H. R.: The Use of Radium in the Treatment of Myxomatous Nasal Polyps: Preliminary Report. *Am. J. Roentgenol.*, 1921, n.s. viii, 407.

One reason that operative results following the removal of myxomatous nasal polyps are not always satisfactory is because the pedicle attaching the polyp to the mucous membrane of a turbinate or a sinus is not definite. Removal of this tumor and its pedicle with nearby tissue or cells does not eliminate the condition because the adjacent tissue also is undergoing a myxomatous change which will soon appear in the form of a polyp.

Radium stimulates the production of fibrous tissue, and after two or three such treatments the primary polyp recurs as a fibromyxoma or a fibroadenomyxoma which can be dealt with much more satisfactorily.

Radium inserted into a large solitary nasal myxoma does not change the type of the tumor or cause its disappearance. Radium applied post-operatively does not prevent the recurrence of a polyp, and the use of radium in treating myxomatous polyps associated with a local suppurative process does not cure the latter.

In early cases treated at the Mayo Clinic the author uses a 50-mg. tube of radium for two hours. Subsequent treatments are given with an interval of one week. The radium tube is placed in the region of the myxomatous tissue and made secure by packing with sterile vaseline gauze. The string tied to the radium tube is attached to the cheek by means of adhesive tape.

The author believes that in the stubborn cases of myxomatous nasal polyps this method of treatment will result in a change from a myxomatous type to a fibromyxomatous type in which operation may be more successfully performed. Moreover, the polyps recur less rapidly after radium treatment and thus the interval of relief is lengthened.

INDUSTRIAL SURGERY

Morehead, J. J.: Traumatic Surgery Problems.
J. Am. M. Ass., 1921, lxxvi, 1642.

The important problems in accident surgery are the prevention and cure of infection of the soft parts, the management of fractures and injuries of the joints, tendons, and nerves, and the after-care of the injured. Of these, the management of infected wounds and the care of broken bones are the most important as infections and fractures are most frequent. No universally accepted treatment for infected wounds or fractures was devised during the war, despite the fact that the attention of surgeons from all parts of the world was focused upon these problems. The author therefore proposes a standardization of the present-day methods of treating such injuries.

In the treatment of wounds, sterilization is essential to success. There are only two methods to accomplish this, mechanical sterilization and chemical sterilization. The first of these is obtained by cutting away all bruised, frayed, or otherwise devitalized tissue. This is effective as bacteria propagate only in tissues deprived of their normal blood supply. For the ordinary chemical sterilization, antiseptic contact is made with every part of the dried wound. After such cleansing, full-strength tincture of iodine is applied. In a wound with a small or tortuous orifice the iodine is introduced with a syringe.

Next to iodine sterilization the most important point is drainage. Every wound not made surgically is already infected. Therefore it must be properly drained after being loosely sutured. Rubber drainage is best.

The first dressing placed on the sterilized, loosely sutured, and drained wound should consist of gauze wet with some non-irritating solution to combat infection from the skin cocci present on the surface of the wound. One dram of full-strength tincture of iodine to a pint of saline makes an excellent solution for this purpose. Rest and elevation are the final measures, and for this purpose a light splint is very useful and tends to prevent possible deformity. Certain very deep wounds should not be sutured at once; the sutures should be merely put in place, not being tied until from twenty-four to seventy-two hours later when it is determined clinically or bacteriologically that streptococci are absent.

In cases of burns of the first stage the author sterilizes the burned area by painting it with a 3.5 per cent watery solution of iodine unless this area is very large or the patient is in shock. He then covers the surface with a gauze dressing wet in 10 per cent sodium bicarbonate, this dressing being kept in place for from twenty-four to forty-eight hours and kept wet by leading the solution into it by means of rubber tubing. The second stage of burns, that of exudation, is treated by exposure of the burned area to sunlight or the open air, the parts being so arranged that contractures will not occur. In the absence of sunlight, exposure is made to the rays of an ordinary

electric light bulb covered with red or yellow paper. No dressing of any sort is placed over the wound, and all secretion from it is gently sponged away with a 5 per cent solution of sodium bicarbonate.

One of the great advances during the war was the recognition of the fact that mobilization rather than immobilization is the best treatment for articular lesions.

In cases of sprains hot applications are indicated during the first few hours, and then the affected joint should be massaged and wrapped in adhesive in such a way that circulation and joint motion will not be impaired. Thereafter, the joint should be moved by the patient every two hours through a full range of motion, massage being given daily over the adhesive. In cases of sprained ankles and knees, walking should be insisted upon after the first period of massage. It is active motion, not passive motion, which promotes circulation, prevents organization of the exudate, limits atrophy, shortens disability, and restores the maximum of function.

Synovitis may be cut short if the effused fluid is promptly aspirated and the joint actively moved every two hours. Re-infusion after the first twenty-four to forty-eight hours is treated by re-aspiration. More than two aspirations are rarely necessary. A safe and simple method of aspirating the knee is to paint the outer part of the joint with iodine, push the patella as far outward as it will go so that it forms a sharp-edged surface like the eaves of a roof, and then insert just under the upper part of the overhanging patella, an aspirating needle of a caliber equal to that of the lead in a pencil.

The therapy of dislocations consists of active mobilization rather than passive immobilization.

In the treatment of fractures there are four R's, namely, recognition, reduction, retention, and re-education. Of these, reduction and re-education are the most important. General anaesthesia should be employed more often in cases of Pott's fracture and in most cases of Colles' fractures. The ideal splint is of the removable type. Molded plaster of Paris two-piece splints are best for permanent fixation. In cases of fractures of the extremities Thomas splints are best for transport. In every joint fracture the author removes the splint and begins massage the day after the reduction. He continues this daily, replacing the splint after each treatment. In cases of Colles' fracture passive motion is begun on the third day and active to-and-fro wrist motion is permitted from the fifth to the seventh day. The anterior splint is removed in from seven to ten days and the posterior splint in from ten to fourteen days. In overlapping fractures of the radius and ulna, certain fractures of the os calcis and tibia, and all fractures of the femur (those of the neck excepted) in which there is overlapping of an inch or more, the musculature is thick, or more than a week has elapsed, more than non-operative methods is necessary. The author recommends skeletal traction in femur cases. In compound fractures the wound is the most important consideration for the first three days, but

during that interval the advantages of provisional traction obtained with a Thomas splint or hanging a weight to the broken limb must not be neglected in order that muscular contraction and an increase of deformity may be prevented.

FREDERICK CHRISTOPHER, M. D.

LEGAL MEDICINE

Administration of Anæsthetics: Burden of Proof of Negligence on Plaintiff in Malpractice. *Lowden vs. Scott (Mont.), 194 Pac., p. 488.*

The defendant caused an anæsthetic to be administered to a patient preparatory to a surgical operation. The patient died from the effects of the anæsthetic before the operation was begun. The evidence showed that the operation, which was for a comminuted fracture of both bones of the right forearm, had been delayed from time to time over a period of two or three weeks solely on account of the patient's intemperance. The patient finally appeared at the hospital "more sober than he had been, but showing the effects of drinking," and, accepting the advice of Dr. Scott, stayed there overnight, during which time the doctor got him in as good condition as possible under the circumstances.

The court stated that a physician is not an insurer, and a malpractice case does not differ in its essentials from any other action for damages arising from negligence. The law does not presuppose that for every injury there must be recovery in damages. The standard of legal duty owed by the physician is the exercise of such reasonable care and skill as is usually exercised by physicians or surgeons of good standing of the same system or school of practice in the community in which he resides, with due regard to the condition of medical or surgical science at that time.

There was no expert testimony in the case that the defendant's action in causing the anæsthetic to be administered indicated lack of ordinary care, skill, or diligence as required in malpractice cases. No presumption of negligence arose from the fact that it was dangerous then to administer the anæsthetic, the evidence showing that the element of danger is present whenever a patient is anæsthetized. From the very nature of the case each of these ultimate facts required for its proof the testimony of an expert and in the absence of such testimony the case failed. J. A. CASTAGNINO.

Privileged Communications to Physicians Not Admitted in Action on Accident Policy. *Maine vs. Maryland Casualty Co., Wisconsin Supreme Court, 178 N. W. R., p. 749.*

The day after he moved a heavy ice box a man insured under an accident policy was attacked with pain in the side and shortly afterward was attended by physicians, taken to a hospital, and operated upon. In an action on the policy after his death, some time later, the medical testimony showed that before he was taken to the hospital some of his physicians

diagnosed his condition as an infection of the gall-bladder. The operation disclosed, however, that a part of the omentum had become gangrenous in an area about the size of the palm of the hand. This portion was removed, but subsequently paralysis of the walls of the intestines developed and a secondary operation was performed. The distention of the bowels caused by this paralysis increased, and as a result thereof death occurred six days after the first operation.

The testimony indicated that this condition was probably produced by twisting due to some violent physical strain on or of the patient's body. There was evidence that the deceased had stated to his physicians that he had twisted himself at the time he moved the ice box, and that he attributed the subsequent pain to such twisting. The physicians further testified that considering the operative and autopsy findings and the statements made to them by the deceased relative to the moving of the ice box, they ascribed the cause of his death to such injury.

A motion was made by the defendant to strike out the testimony of the physicians, which was granted. Thereupon the defendant moved for a directed verdict in its favor, which the trial court granted solely upon the ground that the only evidence of the accident claimed to be the proximate cause of the deceased's death was the statements of the physicians and surgeons who were called to treat him, and as it was the opinion of the court that such testimony was incompetent because of the privilege of the Wisconsin statutes, there was no evidence to sustain the claim of the plaintiff to the effect that there was an accident within the meaning of the terms of the policy. In affirming this judgment the Supreme Court held that, while the patient may waive this privilege, there was no express waiver by him in this instance, and it could not be waived by the administrators, executors, or personal representatives of the deceased, nor by any person standing in the position toward him as did the plaintiff beneficiary in this case (the widow of the deceased).

It was unsuccessfully urged by the plaintiff, largely from the standpoint of the probable injustice that would otherwise result in this instance as well as in similar situations, that under the facts it was intended by the insured that in his taking out such an accident policy there should be a waiver of such privilege. It was claimed that the very nature of the contract implied the anticipation that in case of accident the testimony of physicians or surgeons would be required in order to establish a right to recover, either for the insured himself in case of an injury not resulting in his death, or for the designated beneficiary in case such injury resulted in death, and that the contract of insurance expressly providing for the furnishing of proofs of death necessarily required the statements or evidence of physicians.

It was held that the trial court was right in ruling that the information obtained by the medical witnesses while attending, prescribing for, and operating

upon the patient were excluded by the statute. Another ground of exclusion was that the testimony of the physicians in this case on all the other points on which it was offered would have been of no avail and weight unless there could have been connected with such testimony the declaration of the deceased to these same physicians made some days subsequent to the accident that he injured himself by moving the ice box. Such declarations were held no part of the *res gestæ*, were hearsay, and inadmissible.

Recitals of past events made by an interested person are no more admissible because made to physicians or surgeons, even when necessarily so made to obtain proper treatment, than if made to other persons.

J. A. CASTAGNINO.

Steinhardt, L. A.: The General Rules of Law Governing the Compensation of Physicians and Surgeons. *J. Am. M. Ass.*, 1921, lxxvii, 98.

If a physician or surgeon possesses and uses reasonable skill, judgment, and diligence such as is ordinarily possessed and employed by members of his profession, he is entitled to recover his compensation.

It has been held in an Iowa decision that when in the treatment of a patient a physician is guilty of negligence which results in injury he is not necessarily precluded entirely from recovering compensation, but that the amount of his recovery, if anything, depends on the amount of injury suffered because of his negligence. On the other hand, it has been determined in New York that he may not recover for visits to a patient in the course of which he treated a broken limb when he had been guilty of malpractice as the court held that the implied contract for services was not severable but entire. The Tennessee courts have decreed that the surgeon is not required to possess or exercise the highest degree of skill, provided the operation is beneficial to the patient, even though it might have been performed more successfully by some one else.

In some parts of the United States the so-called "no cure, no pay" agreement is in effect. When such an agreement exists between the physician and the patient, the courts have uniformly required the physician to adhere to his bargain.

It is, of course, customary for the physician to render his services only on the request either of the prospective patient or of some intimate member of his or her family. When the patient himself solicits the services he incurs the liability for compensation. When the services are solicited by a parent for a child, it is the obligation of the parent to pay for the services rendered.

When the services are directly rendered to an adult at the request of another adult, the charge is properly made against the individual to whom the services are rendered, but there is an obligation cognizable at law whereby the individual soliciting the services may be held to have obligated himself to pay therefor. Whether in rendering his bill to the person to whom the services were rendered the physician

thereby waives any claim against the person who solicited his services is a subject on which the courts are not in accord. It would seem, however, that if a relationship of consanguinity exists, the person soliciting the services assumes the obligation to pay therefor. In the absence of a definite understanding the practitioner should assure himself as to the person who assumes the obligation to pay for the services. He may otherwise find himself in considerable difficulty if he should discover it necessary to litigate his claim.

One class of cases in which no obligation is imposed upon the person soliciting the services are those in which emergency services have been rendered to an unconscious person by a physician or surgeon at the request of a third party who bears no relationship to the patient. The patient treated under such circumstances is, of course, liable for the reasonable value of the services rendered, and in the event of his death, his estate is properly chargeable with such compensation.

The established standard of value of a physician's or surgeon's services is the customary charge of physicians or surgeons for like services in the same locality or neighborhood. It is generally accepted that a physician need not prove the value of his services to the defendant, but that the ordinary and reasonable value of like services will be deemed sufficient.

It is, of course, unnecessary for the practitioner to prove the existence of an express contract for compensation as the law implies that a promise by the patient to pay a reasonable sum for the services rendered arises from the mere act of employment itself. The proof of the reasonableness of the charge is not sufficient, however, when the patient is able to show that prior services were rendered by the physician for a less charge and that no agreement increasing the rate of compensation was made.

While it is a well-established and recognized practice, particularly with surgeons, to be guided in their charges by the financial ability of the patient to pay, proof of such financial condition is inadmissible and the surgeon will be called upon to prove the reasonableness of his charge, irrespective of the patient's financial status. Recovery for the performance of an operation is not limited to a sum commensurate with the labor performed and the surgeon's skill or responsibility as the jury may take into consideration also the exhausting study, the time consumed, and the expense incurred by the surgeon in acquiring his professional knowledge and skill.

Expert witnesses are competent to testify as to the value of the medical man's services in an action to recover therefor, and such testimony stands on the same plane as testimony in other cases and is to be weighed by the jury in coming to a conclusion as to the value of the services rendered if it is satisfied with it. The jury is not bound by the expression of opinion of expert witnesses on such a question, and the testimony of such experts is not,

as a matter of law, conclusive on the jury. As a rule, however, when the experts are men of standing in the profession and do not palpably exaggerate the value of the plaintiff's services, juries are inclined to accept their testimony as fixing a reasonable value. The practitioner may be allowed to prove that a patient required unusual attention, and if he establishes this fact by adequate proof, he may be allowed compensation for operations and time spent in addition to his regular visits.

On the question as to what the patient inferentially promised to pay, the physician may show his customary charges to other persons in the vicinity, and state that his rates were known generally and known by the patient. It may be said that the value of professional services may be proved by usage, but such usage must be shown by expert testimony regarding the value of the services or the customary rule of compensation.

The patient is not liable to the physician for other than reasonable compensation when a successful experiment has been tried by the practitioner, even though very great skill may have been exercised and unusual attention given, as a patient is not liable for extraordinary services in the way of experiments.

The patient is entitled, on demand, to a specific bill of the medicines and attendance for which the physician claims compensation. In the matter of the number of visits, the physician is deemed the best and proper judge, and in the absence of proof to the contrary, the court will presume that all of the professional visits made were deemed necessary and were properly made.

The question as to whether or not medical services were rendered gratuitously is one for the jury, and even when there is distinct evidence tending to show that the services were rendered gratuitously, it has been held that such evidence constitutes no legal bar to recovery, but should be submitted to the jury for its determination.

J. A. CASTAGNINO.

Duty As Between Patients—Liability of Mining Company. *Virginia Iron, Coal & Coke Co. et al. vs. Odle's Administrator (Va.), 105 S.E.R., p. 107.*

The Supreme Court of Appeals of Virginia reversed a judgment for \$5,000 damages which the plaintiff's administrators recovered against the defendant company and a physician employed by it to attend its miners, dismissed the case as to the company, and remanded it for a new trial as to the physician.

It appeared that the miner, whose name was Odle, was taken sick Sunday, Oct. 13, 1918, and sent for the physician on Monday. The physician sent medicine, but to daily requests for attendance replied that he could not travel 5 miles to see Odle on account of the many cases of sickness in the camp which required his attention. He visited Odle October 20, however, examined him, and gave him a prescription. Odle died October 24.

The jury was instructed that the right to damages was based on the failure of the physician to visit

Odle after repeated requests to do so until the sixth day after the first request. If Odle was entitled to the services of the physician, if visits of the physician were requested and were reasonably necessary, if it was reasonably possible for the physician to visit Odle within the mentioned time, and if the physician had reasonable grounds to believe that Odle was or might become seriously ill and was apt to die unless he had speedy medical attendance, his duty to Odle was paramount to his duty to all other patients except those who were equally entitled to his services and in equal danger if they were not attended.

However, if it be conceded that the hypothesis was justified by the evidence and was not misleading, the court held that it could not state as a matter of law, as the instruction did, that the duty of a physician to a patient critically ill is paramount to his duty to other patients who are also ill, unless the latter are in "equal danger." Physicians cannot always measure or compare the degree of danger of one patient with that of another, and this is especially true in cases of pneumonia. The condition of the different patients would be a proper element, and a very important one for the physician to consider, but in the final analysis the determination of the question of what the physician ought to do under such circumstances must be determined in large measure by his own judgment. What the jury had to determine was whether he exercised that judgment in good faith. If there was any doubt as to whether or not he exercised good faith in the determination of his duty, it was a proper subject for inquiry and investigation on the testimony of other physicians who had been informed of the situation and the surrounding circumstances, or on other evidence showing or tending to show a lack of good faith. The court was unable to state as a matter of law, however, that "equality of danger" is a test to determine the duty of a physician in a case of this kind.

In an instruction the jury was told that if it believed that, during the week beginning October 13 there were only six or eight cases of pneumonia requiring the care of the physician, and these or other serious cases, equally entitled to his services, did not require his constant attention, then it was the physician's duty to make every reasonable effort to visit Odle during that week; and that if it believed that he could have done so without endangering the lives of the patients who were equally entitled to his services, without extra pay to him, then it was his duty to do so without regard to other patients who had to pay extra to secure his services and who were not in a very serious condition. For any failure in this regard both he and the defendant company would be liable if such failure directly contributed to Odle's death without fault on his part or on the part of those attending him.

In the opinion of the court the facts proved did not establish any liability of the coal company. The physician did not occupy the position of agent in the

usual sense of that term, nor could he be called a servant of the company. The position of the physician was rather that of an independent contractor. This fact, however, would not excuse the company from liability for his acts or neglect if the company was under a contractual obligation, not merely to employ a competent physician, but also to furnish its employee skillful medical treatment in case of sickness. There was no express contract between the company and its employees. It made monthly deductions from their pay, and they understood the agreement on the part of the company to be that, in case of sickness, the miner was to receive the care and attention of the "company doctor" free of charge. If the business was not conducted for profit, but only for the betterment of the service, the advantages were mutual, and unless the employer contracted for a different service, it ought not to be held to any greater liability than ordinary care in the selection and retention of the physician.

Physicians, surgeons, and medical hospitals operated for profit hold out to the world their capacity to furnish skillful medical and surgical treatment and are liable for the malpractice and negligence of themselves and their employees. A mining corporation, however, is engaged in an entirely different business. Its officers and managers are not skilled in medicine and surgery, and if they employ a physician or surgeon, they cannot supervise the details of his work or the manner of its execution. They have not the capacity to do so. For a consideration, the company may enter into a contract with its employees to furnish medical attention at all times during their service. Such a contract is not beyond the powers of the corporation, and if entered into, the corporation is bound by it and obliged to respond in damages for its breach. When such contract is made the company is bound for the malpractice and negligence of a physician employed by it, but such a contract must be proved.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Nyulasy, A. J.: The Supports of the Uterus. *Surg., Gynec. & Obst.*, 1921, xxxiii, 53.

The author presents two propositions: (1) that the primary support of the uterus is its ligaments; and (2) that its secondary support is the pelvic diaphragm which tends to prevent undue stretching of the ligaments under the influence of intra-abdominal strain.

An operation of looping the ligaments in cases of uterine prolapse is described as follows:

Through an abdominal incision the uterovesical pouch is freely opened up and the bladder turned down from the uterus and vagina. The upper free margin of the surgical segment of the cardinal ligament is defined and the ligament bluntly dissected from the posterior layer of the broad ligament. A threaded curved-pedicle needle is then passed under the lower margin of the ligament, a loop of the ligament is drawn forward by the suture, and the base of the loop is sewed down to the lateral wall of the uterus. C. H. DAVIS, M.D.

Thorning, W. B.: Uterine Prolapse: Permanent Fixation by Fascial Flaps. *J. Am. M. Ass.*, 1921, lxxvii, 101.

The method described will be found to have a very limited field of usefulness. There is a certain type of woman in whom this fixation will prove more generally satisfactory than any other method. This is the woman with the typical enteroptotic figure, with slightly stooping shoulders, flat chest, flabby breasts, pot belly, and broad hips. In such women the entire muscular system is soft and flabby, the uterine ligaments are relaxed and attenuated, and the entire pelvic diaphragm presents the appearance of having been torn loose from its attachments. The author's method is as follows:

An ordinary transverse incision, which for the most part is below the upper margin of the pubic hair line, is carried through the skin and subcutaneous tissues and the aponeurosis of the rectus muscles. The upper flap is then separated from the muscles upward for a distance of 3 in. or as much more as is necessary to provide working space. The transverse incision in the fascia of the rectus muscles should be not less than $1\frac{1}{4}$ in. nor more than 2 in. above the pubic symphysis. The rectus muscles are then separated and the peritoneum is opened in the usual way. Through this incision any necessary pelvic work is done. The fundus is then grasped with volsella and the rectus muscle retracted in the opposite direction while the round ligament is attached to the parietal peritoneum of the anterior abdominal wall on each side with a running suture

of plain gut. This step in the procedure is not taken with the idea of securing additional support, but for the purpose of shutting off the pelvic cavity below the point of fixation. The peritoneum is closed with a running suture bringing it snugly around the fundus, and the rectus muscles are brought together with interrupted sutures as nearly to the fundus as possible.

Next, a strip or tongue from 1 to $1\frac{1}{2}$ in. wide is split from the middle of the upper fascial flap. The fundus is then transfixed with a scalpel which carries the incision from one side to the other; the incision is placed as deeply as possible without entering the uterine cavity. The strip of fascia is carried through the incision in the fundus and sutured to the point on the lower fascial flap where it was originally divided. The divided fascia is then reunited with interrupted chromic catgut sutures and the skin is closed in the usual manner.

Some variation in placing the incision in the uterine wall will be necessary according to the degree of mobility present. When there is great relaxation, it can be carried down the anterior wall

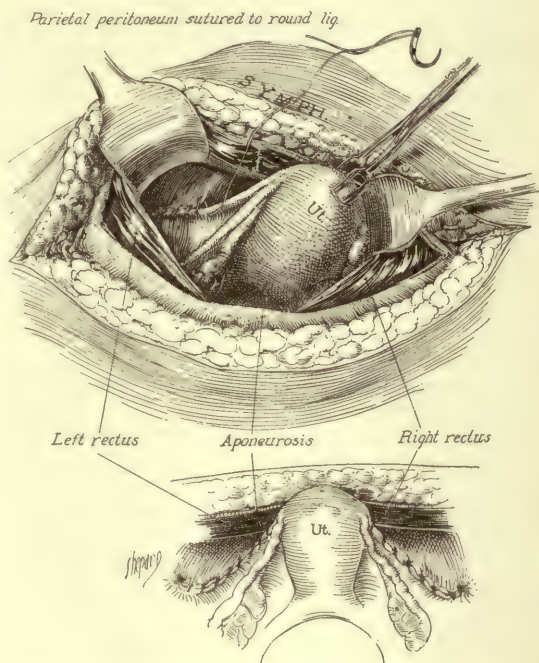


Fig. 1. Running suture of plain gut attaching round ligaments to parietal peritoneum; inset, suture completed. (Illustration by courtesy of *Journal of American Medical Association*.)

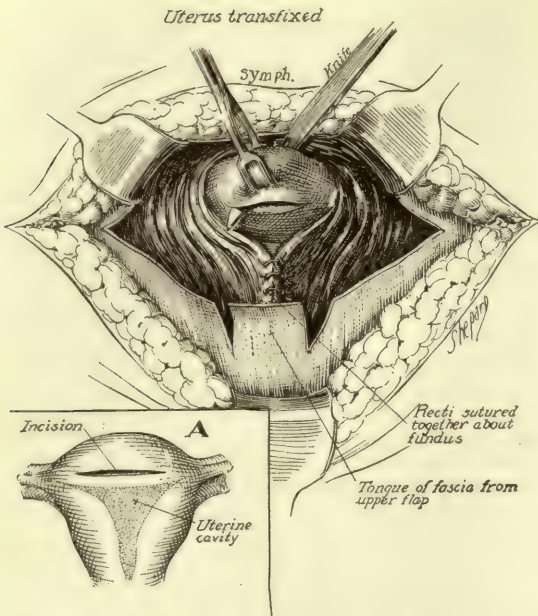


Fig. 2. Rectus muscles brought together; incision through fundus; tongue of fascia split from upper flap. A, relation of incision to uterine cavity. (Illustration by courtesy of *Journal of American Medical Association*.)

and may extend as low as the uterovesical fold of the peritoneum. In two cases the bladder was dissected loose from the anterior wall, and the fascial flap brought out through the cervical portion, the bladder being transplanted by tacking sutures to the anterior fold of the broad ligament.

A little experience will enable one to estimate with considerable accuracy the location of the incision through which the necessary degree of support will be obtained. E. L. CORNELL, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Mahle, A. E.: Adenomyoma of the Fallopian Tube.

Surg., Gynec. & Obst., 1921, xxxiii, 57.

The author gives a careful review of the literature and the principal hypotheses advanced as to the origin of adenomyomata of the fallopian tube. Chiari, in 1887, concluded that 6 of 760 specimens with tubal swellings examined postmortem were not tumors in the strictest sense of the term, but in reality products due to a chronic catarrh of the genital system. Von Recklinghausen, in 1896, completely overthrew the generally accepted hypothesis of the muellerian-duct origin of tubal adenomyoma and advanced the theory that adenomyomata of the fallopian tube originate in the wolffian body as in 27 cases the histologic picture resembled that of the embryonic kidney. In only 2 instances was he able to trace any relation of the adenomyoma to the mucosa of the tube. The first case he explained as

due to a rupture of the gland into the tube lumen, and the second, as a continuation of a union between a wolffian duct and a muellerian duct.

Kossmann, in 1897, demonstrated that the tube could supply gland elements and stated that in a small number of cases he found glandular inclusions in a tubal adenomyoma derived from accessory tubes. He therefore advanced the hypothesis that such adenomyomata arise from the accessory muellerian ducts.

Von Franque, in 1900, and Meyer, in 1903, showed that the epithelial structures of tubal adenomyomata are derived from mature mucous membrane by a process of inflammation. Many of their cases were associated with tuberculous and gonorrhoeal salpingitis, hydrosalpinx, and ovarian disease.

Maresch, in 1908, investigated the origin of what he termed "salpingitis isthmica nodosa," or adenomyomatous structures in the tubal angle. By serial sections and by injecting the tubes he showed the origin of the adenomatous structures to be mature tubal epithelium. In some tubes which showed an extensive glandular infiltration of the tube wall he was able to trace but one point of origin from the tubal mucosa. This explains why in a certain percentage of cases no origin can be determined.

Cullen, in 1908, demonstrated that a wolffian or muellerian duct cannot be the origin of uterine adenomyoma.

From January, 1910, to July, 1920, there were 4,189 fibromyomatous uteri removed at operation in the Mayo Clinic: 332 (7.9 per cent) contained adenomyomata and 23 of these contained adenomyoma of the fallopian tube. The percentage of adenomyomata (7.9 per cent) is somewhat higher than that reported by Cullen in 1908 (5.7 per cent) and that reported by MacCarty and Blackman in 1919 (6.43 per cent). In 14 (60.8 per cent) of the 23 adenomyomata of the fallopian tube Mahle was able to trace a direct origin from mature tubal epithelium. In 6 cases, adenomyomata and tuberculous salpingitis were associated. In these the tuberculous granulation tissue in the tube lumen could be traced into the tube wall surrounding the adenomatous structures. In 3 cases no direct continuation from the tubal mucosa could be demonstrated, but serial sections through the entire tube on the uterine side showed the absence of any gland structure. From this it was concluded that the point of origin was most probably the tubal mucosa, but because of the inadequacy of methods of sectioning no direct point of origin from the tubal mucosa could be found. These latter cases are perhaps similar to those reported by Maresch.

Of the 23 cases reported, 5 were associated with acute salpingitis, 6 with tuberculous salpingitis, 1 with hæmatosalpinx, 1 with hydrosalpinx, 1 with ectopic pregnancy, and 1 with papillary carcinoma of the ovary. All the specimens examined showed some evidence of an inflammatory reaction ranging from a moderate lymphocytic infiltration in some

parts of the tube to an acute purulent salpingitis. Other signs of pelvic inflammation were found in the remainder of the cases.

Grossly, these tumors are situated in the proximal end of the tube and isthmus and appear as small swellings varying from a slight, scarcely noticeable thickening of the wall of the tube to a mass 1 cm. to 2 cm. in diameter. As a rule, the process is circumscribed, although in 1 case it extended through the entire length of the tube.

Twelve (52.1 per cent) of the adenomyomata were bilateral, 7 (30.4 per cent) were on the right side, and 4 (17.4 per cent) on the left.

The average age of the patients was 37½ years. The eldest was 64 and the youngest 17 years. A history of previous pelvic infection was given in 34.7 per cent of the cases. Eighteen (78.25 per cent) of the patients had never given birth to living children, and 15 (65.2 per cent) had never been pregnant. Only 2 of the 33 patients had had apparently normal pregnancies. Ninety-one and three-tenths per cent of the patients had abdominal pain, and 43.4 per cent complained of a vaginal discharge. The average duration of symptoms was 31.3 months.

Histologically the glandular structure of tubal adenomyomata is immediately surrounded by smooth muscle fibers. The cellular mantle so common in uterine adenomyomata is either absent entirely or very thin.

In conclusion the author states that the term "tubal adenomyoma" is correctly applied to adenomyomata arising in the tube, that they are in every case associated with an inflammatory condition, and are most probably end-products of the process of inflammation. There is some relationship between sterility and the presence of adenomyomata of the fallopian tube.

J. E. STRUTHERS, M.D.

Cottalorda, J.: Hydatiform Moles, Chorio-Epitheliomata, and Corpus Luteum Cysts of the Ovary: Etiological, Clinical, and Operative Relationships (La mole hydatiforme, le chorio-épithéliome et des kystes lutéiniques de l'ovaire: rapports étiologiques, cliniques et opératoires). *Gynéc. et obst.*, 1921, iv, 119.

The author made a statistical review of the literature to determine: (1) the percentage of hydatiform moles which degenerate into malignant

chorio-epitheliomata; (2) the number of cases of chorio-epitheliomata in which there is a history of hydatiform mole; (3) the relation between chorio-epitheliomata, hydatiform moles, and corpus luteum cysts of the ovaries; and (4) the importance of the presence of corpus luteum cysts as an indication for operation.

He found that 9 per cent of hydatiform moles degenerate into malignant chorio-epitheliomata and that a history of hydatiform mole is given in 50 per cent of the cases of chorio-epithelioma. Bilateral corpus luteum cysts are present in 59 per cent of the cases of hydatiform mole and in 9.4 per cent of the cases of chorio-epithelioma. Corpus luteum cysts are intimately related to moles and chorio-epitheliomata in both etiology and evolution. The presence of a hydatiform mole with corpus luteum cysts is a definite indication for total hysterectomy and ovariectomy. The presence of a mole without corpus luteum cysts should indicate curettage and close observation afterward so that a hysterectomy may be performed later if hemorrhages or cysts develop.

LOYAL E. DAVIS, M.D.

EXTERNAL GENITALIA

Bérard, L. and Dunet, C.: Multiple Cysts of the Vagina of Wolffian-Duct Origin (Kystes multiples du vagin d'origine wolffienne). *Gynéc. et obst.*, 1921, iv, 89.

The majority of vaginal cysts arise from embryonic rests which are stimulated to activity during the period of gestation. This etiological theory appears to be the only satisfactory single explanation of the usual case.

Certain rare vaginal cysts arise from embryonic rests derived from the muellerian ducts, but those which are more common arise from embryonic inclusions which are part of the wolffian ducts. The particular embryonic origin of these tumors may be determined from the character of the epithelial lining of the cyst walls. Pavement epithelium denotes a muellerian-duct origin whereas unistratified cylindrical epithelium, which at times may be ciliated, is characteristic of wolffian-duct origin.

The authors removed a vaginal tumor consisting of a principal and two accessory cysts. From microscopic examination of the cyst wall, they concluded it originated in an embryonic rest derived from the Wolffian ducts.

LOYAL E. DAVIS, M. D.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Killian, J. A., and Sherwin, C. P.: Some Chemical Studies in Normal and Abnormal Pregnancies. *Am. J. Obst. & Gynec.*, 1921, ii, 6.

The authors reach the following conclusions:

1. Low values for non-protein and urea nitrogen are found in normal pregnancy. The urea nitrogen constitutes about 44 per cent of the non-protein nitrogen. There is no variation in the uric acid, creatinine, chloride, or sugar concentration of the blood of normal pregnant women from that observed in non-pregnant women. A slight decrease in the carbon-dioxide combining power of the blood plasma characterizes the last months of normal pregnancy.

2. The chemical changes noted in the blood in the nephritic toxæmias are typical of impairment of kidney function in general. There is an increase in non-protein and urea nitrogen, and more than 50 per cent of the non-protein nitrogen is in the form of urea nitrogen. Some of the clinical symptoms also point to a more or less severe nephritis. At most, only slight improvement follows the emptying of the uterus.

3. Analogous chemical changes are found in the blood in pernicious vomiting, postpartum eclampsia, and eclampsia associated with pregnancy. The non-protein nitrogen is markedly increased whereas the urea nitrogen is at the low normal limit or decreased, constituting 15 to 38 per cent of the non-protein nitrogen. There is a definite increase in uric acid due to impairment of renal function. In some cases the disturbance of the kidney function results in retention of urea nitrogen in addition to the uric acid. In this type of toxæmia the involvement of renal function is a result of the toxæmia. A moderate or severe acidosis is observed in all cases. In most instances evacuation of the uterus is followed by prompt improvement as judged from the clinical standpoint and the chemical composition of the blood.

E. L. CORNELL, M.D.

Caldwell, W. E., and Lyle, W. G.: The Blood Chemistry in Normal and Abnormal Pregnancy. *Am. J. Obst. & Gynec.*, 1921, ii, 17.

In 34 cases of eclampsia and toxæmia of pregnancy there were 26 typical eclampsias; 3 other patients were admitted to the hospital in coma without convulsions and were considered to be suffering from uræmia; 4 were considered to be pre-eclamptic; and 1 was an epileptic with toxæmia during pregnancy.

In this series death occurred in every case in which there was high retention of all the blood constituents indicating marked kidney insufficiency. In some cases the kidneys were only slightly involved, as shown by the fact that the blood taken two days postpartum was practically normal.

The importance of a high creatinine retention in denoting kidney insufficiency is well demonstrated by the authors' tables. Frequently it accompanies high retention of other nitrogenous waste products, but occasionally the creatinine and the uric acid are the only constituents of the blood which are definitely increased. Of 9 patients with creatinine above 3 mg. 5 died and 2 subsequently developed chronic nephritis. The remaining 2, when seen thirty months later, had had normal pregnancies and showed no signs of nephritis. Altogether there were 9 deaths, and in 5 of these cases the creatinine values were high.

In the entire series, both in the pre-eclamptic condition and in eclampsia, there was high retention of uric acid, but in none of the cases in which the uric acid returned to normal early in the convalescence are there now any signs of nephritis. When the uric acid remained high throughout the obstetrical period, especially if there was a high creatinine retention, the patient had chronic nephritic when heard from thirty months later. The following conclusions are reached:

1. In normal pregnancy as compared with the non-pregnant state we find a low total of non-protein nitrogen, low urea nitrogen, and a very low ratio of urea nitrogen to the total non-protein nitrogen.

2. The excretory nitrogenous constituents in the maternal and the foetal circulations at the end of labor are practically identical.

3. A definite retention of uric acid in the blood at the end of labor is found only in abnormal cases.

4. The blood pictures in eclampsia and toxæmia of pregnancy are interpreted most readily in terms of kidney insufficiency.

5. The significance of a given blood picture can be defined only in the light of the clinical conditions at the exact time when the blood was taken.

6. Marked kidney insufficiency, indicated by high retention of nitrogenous waste products, indicates a very grave prognosis.

7. High creatinine retention seems to indicate a serious prognosis.

8. When the nitrogenous constituents do not return to normal early in the convalescence the prognosis for subsequent pregnancies is doubtful.

9. A rapid return of the blood picture to normal indicates a favorable prognosis for subsequent pregnancies.

E. L. CORNELL, M.D.

Moore, E. C.: Abdominal Pregnancy with a Living Child. *Surg., Gynec. & Obst.*, 1921, xxxiii, 65.

Moore reviews 20 cases from the literature in more or less detail and then reports a case of his own. In every instance the mother and child left the hospital in good condition and lived some time thereafter.

The author's case was that of a para-i, aged 29, who had been married for five years. The last menstruation occurred March 12, 1915, and lasted one day, though the usual duration was five days. About eight weeks later the patient suffered severe pain in the lower abdomen which was more severe on the right side. This caused faintness and vomiting. The patient's physician advised operation but she refused.

The pain persisted with more or less severity, and occasionally was associated with a bloody vaginal discharge. At operation, performed by the author November 27, the placenta was found attached to the posterior surface of the right broad ligament and the child was discovered among the intestines behind the spleen. The placenta and broad ligament were removed *en masse* and a living female child weighing 5 lbs., 9 oz., was delivered. Both mother and child were well November 12, 1920.

FREDERICK CHRISTOPHER, M.D.

Blair, A. C.: A Case of Placenta Prævia Centralis with Spontaneous Delivery of the Child. *Brit. M. J.*, 1921, i, 10.

In the author's experience of about 3,000 cases the frequency of placenta prævia of the incomplete type was about 1 case in 350 while that of placenta prævia centralis or the complete type was 1 case in 800. Pinard is quoted to the effect that marginal placenta prævia is the most common variety. The complication is rare in primiparæ but increases in frequency with the number of pregnancies.

The general trend of opinion among obstetricians with regard to the treatment seems to be that on account of the dangers of unavoidable hæmorrhage the pregnancy or labor should be terminated as soon as possible after the condition is diagnosed. A massive hæmorrhage may coincide with the beginning of labor with considerable danger to the mother and child. Many obstetricians regard cæsarean section as the operation of choice. When there is doubt as to the size of the pelvis and the relative proportions of the baby the author prefers version and extraction. With cephalic presentation and full dilatation, high or medium forceps extraction may be done in the case of a multipara with an ample pelvis and proportionate foetal diameters. It is open to question whether cæsarean section is justifiable in all cases of complete placenta prævia.

The case reported was that of a multipara in her eighth pregnancy at term. The position of the foetus was right occipito-anterior. At examination the os was found to be patulous and oozing blood. Palpation indicated placenta prævia. As the patient refused hospital care, daily packing was done at her home. Hæmorrhage had practically ceased on the second day, and on the seventh day labor set in following a sudden gush of blood. Delivery occurred after fifteen minutes of labor. Moderate hæmorrhage followed the precipitate birth of a male child, but

was stopped by manual removal of the placenta followed by intra-uterine hot douches and pituitrin.

Examination of the placenta explained the manner of the child's delivery. The case was one of placenta prævia centralis with thinning of the tissue near the insertion of the cord. At the latter point the pressure of the head had torn through. This occurrence suggests the possibility of cephalic delivery in such cases with less danger to the child and mother than version because there would be less delay during the second stage. W. N. ROWLEY, M.D.

Vogt, E.: The Development and Improvement of the Suprapubic Cæsarean Section at the University Gynecological Clinic of Tuebingen (Ueber die Entwicklung und den Ausbau der suprasymphysæren Schnittentbindung an der Universitäts-Frauenklinik Tuebingen). Berlin: Karger, 1921.

The author first reviews the development of the technique of the suprapubic cæsarean section at the gynecological clinic of Tuebingen since Sellheim's day. The technique is as follows:

With the patient in the Trendelenburg position, the abdominal cavity is opened by a transverse or longitudinal incision just above the symphysis pubis and the peritoneum is packed off with gauze. The peritoneum of the plica uterina is then split transversely for a distance of 7 to 8 cm. at the point where it goes over into the less loosely attached peritoneum of the anterior uterine wall. The peritoneum, together with the bladder, is now pushed downward by blunt separation as far as the external os of the uterus. The anterior wall of the cervix is opened at the point of greatest bulging and the evacuation of the uterus accomplished by the Sellheim manoeuvre or by means of forceps on the head. The incision in the uterus is closed with catgut sutures, this first suture line being reinforced with a continuous suture through only the superficial muscle layers of the cervix.

The Trendelenburg position is recommended for every case. Practically all cases are operated upon under lumbar anæsthesia induced with novocaine. Contra-indications to lumbar anæsthesia are prolapse of the cord and eclampsia. Lumbar anæsthesia has shown no disadvantages as regards its effect on the labor pains, the mother, or the child. The convalescence is without incident. If sterilization of the patient is necessary it is easily accomplished in this operation.

The author discusses in detail the various indications for the procedure described, with particular emphasis upon its advantages over the classical cæsarean section and other methods. The intra-peritoneal cervical incision excels the extraperitoneal incision in many respects. Even in infected cases or those in which infection is suspected, the cervical incision has a certain value but on the basis of his own experience the author is unable to state whether in this procedure the extraperitoneal or the intra-perineal method is better. There is no danger to the child. BODE (Z).

LABOR AND ITS COMPLICATIONS

Davis, E. P.: The Induction, Complicated by Hæmorrhage, of Labor. *Am. J. Obst. & Gynec.*, 1921, ii, 1.

The induction of labor has established its place among the most valuable operations of obstetrical surgery. At present in the cases of primiparous patients labor is rarely induced because of contracted pelvis, but is indicated when pregnancy is turning the scale against the patient's general health and the saving of health or life may be hoped for if pregnancy is terminated. Such are cases of disease of the heart complicated by pregnancy, tuberculous infection complicated by pregnancy, toxic conditions not yielding to treatment, and profound disorder of the nervous system greatly aggravated by pregnancy.

In the cases of multiparous women induction of labor is indicated more frequently. When the patient has had several difficult labors with children disproportionate to her pelvis; when, after having borne several children, the mother shows a tendency to go overtime; and when severe visceral disease is present, labor is often induced.

In cases of placenta prævia, labor may be induced to advantage when the situation of the placenta is such that rupturing the membranes alone will suffice to control hæmorrhage through pressure by the presenting part.

In fulminant toxæmia, with or without convulsions, termination of labor is indicated only when the patient is practically in, and has largely completed, the first stage. Rupture of the membranes then will be followed by temporary cessation of the convulsions, but these will return with increased violence when the uterus begins to act.

Two methods at present are commonly employed: the stimulation of uterine contractions by: (1) introduction of a foreign body within the uterus or by rupture of the membranes and decreasing the quantity of amniotic liquid, and (2) the administration of drugs.

It has been urged as an objection to the use of bougies that they may separate the placenta or pierce or wound the tissue at the placental site in such a manner as to cause hæmorrhage. In this connection the author states that it can be readily understood that the placenta might be easily wounded by bougies if it is attached unusually low, and that any cause which produces uterine contraction in a toxic patient or one whose decidua is diseased may result in separation of the placenta.

Davis reports three cases of hæmorrhage due to the use of bougies. In the first case a cæsarean section was performed and a chorio-epithelioma was found. In the second case immediate cæsarean section was necessitated by premature separation of the placenta. In neither case did the bougie cause the hæmorrhage directly. In the third case, in which delivery was normal, no cause for the hæmorrhage was discovered. In a fourth case, the bougie passed through the placenta but hæmorrhage did not result.

On the basis of his experience the author is inclined to believe that while there is a possibility of serious hæmorrhage, the use of bougies has been the most uniformly successful of any method employed for the induction of labor as it produces labor more closely resembling spontaneous parturition than any other.

E. L. CORNELL, M.D.

Quante, J.: Personal Experiences with Symphyseotomy on Primiparæ and Multiparæ (Unsere Erfahrungen mit der Symphyseotomie bei Erst- und Mehrgebaerenden). *Zentralbl. f. Gynaek.*, 1921, xlv, 513.

Twenty-four cases are reported. The technique of operation is not difficult. Injury of the soft parts was not observed. Severe injury involving the sacro-iliac synchondrosis also did not occur in any case, and in only two cases was there mild injury of these articulations.

Of twenty multiparæ only eight had spontaneous deliveries. In the remaining twelve cases operative interference was required. In five cases version was necessary, in three because of failing labor pains. Forceps were applied seven times, once for eclampsia, once because of failing labor pains, and in the remaining five cases because of failing heart tones.

Of the four primiparæ three had spontaneous deliveries. In the other case the use of high forceps was necessary and resulted in severe injury of neighboring structures (laceration of the urethra which, however, was followed by uneventful healing).

Of the twenty-four mothers one died of sepsis. One of the children died shortly after birth, and another, which was delivered by means of forceps applied to the sinciput, died with general convulsions of the extremities.

The puerperium in thirteen cases was entirely normal. In the remaining eleven there was moderate fever, and in two there was suppuration of the symphyseal wound. No unfavorable results have followed.

KALB (Z).

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Kaiser, F. J.: Perirenal Urinary Cysts (Perirenale Urincyste). *Ztschr. f. urol. Chir.*, 1921, vi, 286.

The fluid accumulations in the tissues surrounding the kidney which are frequently described in the literature differ as regards their origin, localization, and contents, and have been variously named by different authors. Kaiser recommends classifying them according to their contents. He proposes that all extra-renal urinary accumulations be termed "perirenal urinary cysts" and all other serum containing accumulations "perirenal blood or serum cysts."

In ruptures of true hydronephrosis the place of origin of the urinary infiltration into the perirenal tissues can be ascertained easily, but this is difficult when the kidneys are otherwise normal. In difficult cases we must assume either an exudation of urine from the parenchyma or the presence of very fine intercommunications such as have occasionally been demonstrated. Kaiser reports an interesting case:

The patient, a man aged 24 years, had been run over by a wagon. The right abdominal and lumbar regions were very sensitive to the touch but because of the patient's relatively good condition he was treated at first conservatively. Improvement continued until the twelfth day when there suddenly appeared in the right abdomen, in association with pain and vomiting, a fluctuating mass the size of a child's head. Repeated punctures withdrew urine. Cystoscopic examination showed that no urine passed through the right ureter. The diagnosis between hydronephrosis and perirenal urinary cyst was made by means of pneumoperitoneum. Nephrectomy verified the diagnosis. Recovery followed.

The author states that probably the injury was followed first by a hæmorrhage, and that the leakage of urine due to rupture of the ureter which had become necrotic in its upper end was secondary. Serious urinary infiltration was prevented by the fact that the urine was caught in the capsule previously formed by the blood.

In the diagnosis of perirenal urinary cysts, as shown by the case reported, it should be borne in mind that true hydronephrosis develops much more slowly than a perirenal urinary cyst. In injuries of the renal pelvis or the ureter the hæmorrhage may be so insignificant that it does not become manifest by the ordinary routes.

The prognosis as regards cystic encapsulation is more favorable the slower the accumulation of fluid and the later it appears after the injury.

VOLLHARDT (Z).

Gorash, W. A.: Metastatic Hæmatogenous Abscesses of the Kidney (Die metastatischen hæmatogenen Nierenabscesse). *Verhandl. d. Wiss. Ver. d. Aerzte d. St. Trinitatis-Krankenh.*, Petrograd, 1920.

In cases of bacteræmia, which may have its origin in localized pus foci (panaritium, furuncles, carbuncles, etc.), metastatic hæmatogenous abscesses of the kidney occasionally develop. These are found in the cortex where the Henle loops and capillary vessels are most abundant. The theory that trauma is essential for their development is incorrect. In the author's opinion the rich vascularity of the kidney and renal congestion are of such greater importance. The filtration of bacteria through the kidney takes considerably longer than the filtration of fluids. The greatest hindrance to the filtration of bacteria is in the renal cortex.

Hæmatogenous abscesses must be differentiated from pyelogenous abscesses. Early diagnosis of the former is difficult on account of their cortical localization, and frequently in practice is not made until the patient reaches the operating table, when perforation into the pelvis or perirenal tissue has already occurred.

The number of hæmatogenous metastatic abscesses of the kidney so far reported is very small. The author could find only 21. The diagnosis was made before operation in only 3 cases. The primary causes of infection were parasites, furuncles, carbuncles, tonsillar abscesses, suppurative parotitis, septic abortion, and gonorrhœa. The latent period between the primary infection and the development of symptoms of the renal abscess varied from two to six weeks. Cases have been described in which the primary focus was entirely healed at the time the secondary kidney involvement began. In one case reported by Israel the kidney symptoms began two months after the healing of a carbuncle on the neck.

After reviewing the histories of the 21 cases the author reports a case of his own. The patient was a man 38 years of age who had a carbuncle of the neck. After a period of ten days he was seized with chills and fever, vomiting, and pain in the region of the right kidney. A few days later a swelling could be made out. Cystoscopic examination was normal. At operation a von Bergmann incision was made. An abscess having been found in the posterior lower quadrant, nephrotomy was done. The pus contained staphylococci. Staphylococcus vaccine therapy effected a cure.

The clinical picture of the hæmatogenous metastatic abscess of the kidney develops rapidly under the picture of a general infection. Most frequently the condition is mistaken for influenza, typhoid

fever, appendicitis, pleurisy, pneumonia, or lumbago. Examination of the urine reveals nothing definite as the cortical abscess does not communicate with the urinary tubules. Slight albuminuria or cylindruria cannot be considered as necessarily indicating the presence of a renal abscess, but if the abscess ruptures into the renal pelvis its constituents will, of course, be found in the urine. Cystoscopy also may be of great aid in the differential diagnosis.

To the most important symptoms belongs pain in the region of the kidney which begins suddenly and with great intensity. This pain radiates to the corresponding parts of the upper abdomen and is constant. The latter fact speaks against renal colic. The most sensitive point is at the attachment of the eleventh and twelfth ribs to the spine. Here there is also hyperæsthesia of the skin and muscular rigidity. Leucocytosis is present. Kidney function is usually normal. The pain has an intrarenal character. Jaffe has recommended exploratory puncture in doubtful cases. In the author's opinion this should not be done as the abscess is often small and therefore difficult to strike. If the disease process spreads to the renal pelvis or the perirenal tissue the signs of pyelitis or paranephritis become evident. The diagnosis of a renal abscess on the right side is more difficult than that of an abscess on the left side as the former condition may be confused with appendicitis or cholecystitis.

When untreated, renal abscess usually leads to pyelonephritis. The earlier the operative interference the more conservative it may be. Frequently in the early stages nephrolysis with opening of the abscess and drainage is sufficient. If there are multiple abscesses we must choose between nephrotomy and primary nephrectomy. The latter procedure, however, may be fatal if the other kidney becomes involved. In determining the indication for nephrectomy the patient's general condition, the character of the infection, and the functional capacity of the other kidney must be considered. If operation is performed early the prognosis is not unfavorable. In cases of solitary abscess of the kidney opening up and drainage usually suffice. Primary nephrectomy is indicated in cases of multiple, not circumscribed abscesses with marked infiltration but only if the other kidney is sound and there are no signs of a general infection. If the other kidney is not sound or if general infection is present a nephrotomy should be done.

For the postoperative therapy silver preparations and vaccines are indicated. Especially in the presence of a staphylohaemia, vaccine therapy gives good results.

HESSE (Z).

Chute, A. L.: Some Hypotheses Regarding Renal Tuberculosis. *J. Urol.*, 1921, v, 431.

The author assumes that all tuberculous invasions of the kidney are hematogenous and secondary to a focus elsewhere in the body. In his own experience he has seen very few cases in which the infection

was spread by way of the lymphatic route from a focus in the chest or from the bladder through the ureter.

The possibility that tubercle bacilli may enter the kidney by way of the blood stream from a previously existing lesion is universally accepted although there are certain objections to this hypothesis. One of these objections is that hematogenous infection would tend to involve both kidneys whereas in numerous surgical cases of renal tuberculosis the lesion is unilateral. Bilateral involvement is present in only one case in seven. Chute states, however, that clinical observations made by him seem to reconcile these apparently contradictory facts and allow him to formulate certain working hypotheses regarding the manner in which the infection occurs.

In this connection he cites what were apparently two cases of tuberculosis of the kidney, both showing in the X-ray examination small calcified areas just under the capsule. These patients were operated upon, the calcified areas being scraped away, and both of them subsequently developed surgical tuberculosis which made a nephrectomy necessary. In neither case were the symptoms or findings similar to those commonly noted in renal tuberculosis, nor did the kidneys, when exposed, have the appearance characteristic of tuberculosis. It is the author's opinion that if these patients had not been operated upon they would eventually have overcome the infection.

Reference is made also to the case of a patient who complained of pain in the renal area and whose urine contained a few red blood cells and leucocytes but no tubercle bacilli. X-ray examination was negative. In a short time this patient was relieved of the pain and went on to complete recovery. Chute is of the opinion that this case was similar to the two others reported, but not so severe.

The working hypotheses formulated by Chute are as follows:

As anatomical evidence of old tuberculous processes is frequently found in the apices of the lungs of persons who never showed definite symptoms of pulmonary tuberculosis, it is probable that incipient and very mild renal tuberculosis also is much more common than is generally believed. If the hematogenous origin of renal tuberculosis is accepted, we must assume that the tubercle bacilli are brought in approximately equal numbers to both kidneys, that small cortical infections are common, and that in the great majority of cases these cortical infections are common, and that in the great majority of cases these cortical infections are overcome by the rich vascularity of the kidney, progressing to the stage where the condition is recognizable through the presence of pus in the urine only when the kidney is especially susceptible by reason of injury or some other cause.

When pus is found in the urine the condition has reached an advanced stage and ordinarily cannot be cured in the sense that it can be brought to a standstill before the kidney function has been destroyed.

The probability that this process will overcome both kidneys is one-seventh the probability that it will overcome one kidney.

At least some of the patients who complain of dull pain in one loin and whose urine is sterile but contains a few blood cells and leucocytes are carrying on a struggle to determine whether a tuberculous infection will overcome a slightly infected kidney or whether the kidney will overcome the infection.

This last point has perhaps a practical bearing. A patient who is having occasional attacks of unexplainable acute pain or of fairly constant dull pain in one loin and whose urine shows a little blood and a few leucocytes should be advised of the importance of rest and of building up his resistance as he may be dealing with an incipient renal tuberculosis which may be cured if proper care is given.

GILBERT J. THOMAS, M. D.

André and Grandineau: Ureteral Reflux in the Second Kidney in the Course of Renal Tuberculosis (Le reflux urétéral dans le second rein au cours de la tuberculose rénale). *J. d'urolog. méd. et chir.*, 1921, xii, 1.

In almost all the cases of ureteral reflux in the course of tuberculosis which have been reported in the literature the phenomenon was noted on the tuberculous side only. In the three cases reported in this article and in two others which the authors found in the literature the reflux was into the non-tuberculous kidney. In no case was there tuberculous involvement of the kidney toward which the reflux occurred although in some there was evidence in the meatus and ureter that the tuberculous process was ascending.

The authors discuss various theories regarding reflux and conclude that as a rule the lesions of the bladder produced by the tuberculosis of one kidney cause the reflux into the second ureter through anatomical and functional changes in the intraparietal segment of the ureter and through the intensity of the contractions of the muscle of the bladder. In a bladder long exposed to tuberculosis the ulcerations may extend to the neighborhood of the healthy ureter, involve the lips of the meatus, and cause them to gape. This, however, is rare. As a rule the meatus remains intact in the midst of surrounding ulcerations although occasionally the latter have permeated the lower end of the ureter. In the latter type of case there may be destruction of the vesical fibers which, according to some authors, form a sort of ring around the ureter and aid in its closure. The tuberculous bladder is extremely irritable and its sudden violent contractions produce a sudden increase in the internal pressure while at the same time contraction of the sphincter offers an obstacle to the expulsion of urine. Both conditions are favorable to the production of a ureteral reflux.

In one of the authors' cases which came to autopsy the anatomical findings showed phenomena which

clearly indicated ascending tuberculosis of the ureter. Ulceration and granulation were present in the lower part of the ureter in the absence of any sign of tuberculosis in its upper portion or in the kidney. The tuberculous infection was propagated from the first kidney by the descending route to the bladder and from there extended to the normal side by the ascending route.

Ureteral reflux in the second kidney suggests the possibility that errors may arise in the interpretation of the results of ureteral catheterization. When tuberculosis is evident in one kidney and pus and bacilli are obtained from the other side, the presence of bilateral tuberculosis might be deduced when there was merely a reflux in the second kidney. In such cases, therefore, the possibility of a reflux must be borne in mind. To the usual signs the authors add that of pain in the second kidney due to ureteral or pelvic distention.

In cases of slight reflux in the opposite kidney and absence of ureteral dilatation and pyelitis the removal of the diseased kidney in cases of unilateral tuberculosis always results in a rapid amelioration of the bladder condition and cessation of the reflux into the second kidney.

When the reflux in the opposite kidney is marked and associated with ascending dilatation the bladder condition will not be improved by nephrectomy and the reflux will continue without diminution and endanger the second kidney. This condition is best treated by permanent lumbar drainage of the kidney pelvis, the drain being placed by a simple nephrotomy. The authors have found this method of value to obtain complete vesical exclusion without ligating the ureter. It is advisable also to establish this drainage of the kidney pelvis before removing the tuberculous kidney, especially when the function of the non-tuberculous kidney is clearly diminished. If the function of the non-tuberculous kidney is very poor even a nephrotomy should not be attempted.

W. A. BRENNAN.

Hale, N. G., and Von Geldern, G. E.: Ureteral Diverticula. *California State J. M.*, 1921, xix, 284.

An American farmer, 37 years of age, gave a history of pain in the lower left quadrant of the abdomen about 1 in. from the anterior superior spine which was associated at times with nausea and vomiting and was first noticed about seven years ago. In all, he had had six attacks which were progressive in their severity. In the more severe attacks the sharp and colicky pain was associated with nausea, vomiting, a burning sensation, frequent micturition, and prostration which compelled the patient to remain in bed for two weeks.

Cystoscopy was negative. Ureteral catheterization showed that the right side was free from obstruction, but the left was occluded about 10 cm. from the ureteral orifice. X-ray examination showed an ovoid shadow lying diagonally over the first sacral vertebra. The tip of the catheter was within this oval shadow.

The condition was diagnosed as an abnormally dilated ureter, probably congenital. The attacks of pain were thought to be due to kinking of the ureter.

At operation, an appendix-like projection attached to the ureter by loose adhesions was found about 10 cm. from the bladder. This was ligated and removed.

LOUIS GROSS, M.D.

Battle, W. H.: Removal of Stones from the Pelvic Portion of the Ureter. *Brit. M. J.*, 1921, i, 6.

The operations described in the textbooks for the removal of stones from the pelvic portion of the ureter are devised with the intention of avoiding the peritoneum. Intraperitoneal direct incision of the ureter followed by closure of the opening has been practiced, but the results are not so good as those following the extraperitoneal method. The following types of operation are recognized at the present time:

A. Extraperitoneal: (1) exposure of the lumbar segment of the ureter; (2) exposure of the whole length of the ureter; (3) exposure of the ureter at the brim of the pelvis and in its pelvic portion; (4) parasacral route for exposure of the pelvic segment; (5) vaginal route; (6) vesical route for calculi in the intramural portion of the ureter; and (7) trans-vesical route for calculi lying in the lower 2 in. of the ureter outside the bladder wall.

B. Transperitoneal: (1) exposure of the ureter at the brim of the pelvis and its pelvic segment.

Frequently, in attempting to locate the stone, it is advantageous to open the peritoneal cavity and explore the ureter with the finger. During the recent war the author operated upon three patients with symptoms of impaction of a urinary calculus in the pelvic portion of the ureter.

The technique of operation consists in an oblique incision from midway between the anterior superior spine of the ilium and the umbilicus in the direction of the pelvic spine. The sheath of the rectus is opened and the muscle separated from the sheath and retracted inward. The posterior sheath and peritoneum are incised and the viscera packed off with gauze. When the stone is located, the forefinger of the left hand is worked extraperitoneally directly to its location. If possible, the ureter is then elevated and incised longitudinally directly over the stone, care being taken to avoid any blood vessels. By this method there is less danger of breaking the stone.

The risk of peritonitis is practically nil as the opening into the ureter is made extraperitoneally. The incision into the peritoneum is closed with a continuous suture and the muscle is sutured over it. Any discharge which may appear during convalescence is carried away through the lower part of the wound which is left open for the passage of a drainage tube or gauze drain.

Another advantage of this method is that it permits examination of other organs that may be affected, such as the kidneys and appendix, and there is no resulting weakness of the abdominal wall.

MERLE R. HOON, M.D.

BLADDER, URETHRA, AND PENIS

Young, H. H., and Wesson, M. B.: The Anatomy and Surgery of the Trigon. *Arch. Surg.*, 1921, iii, 1.

The anatomy of the trigon, particularly the trigonal muscle, is described in detail. The view that the "internal sphincter" is pulled open by the trigonal muscle has supplanted the belief that the opening of the "sphincter" is an inhibitory action. The present view is supported by endoscopic and cystoscopic studies and by the fact that obstruction to urination is generally followed by hypertrophy of the trigon with corresponding atrophy when the obstruction is removed.

Occasionally following marked obstruction there is an undermining of the trigon, the hypertrophied muscle being dissected away from the bladder wall. On contraction it stands up as a ledge, dividing the bladder into two parts and preventing complete emptying. After this ledge is split the trigon is able to resume its normal function. If, however, the trigon has been completely removed, micturition is not normal as the bladder is not completely emptied.

The trigonal muscle is composed of an extension of the longitudinal muscle layer of the ureters and their sheaths and is superimposed on the muscle of the bladder wall. The embryology and anatomy of the vesical orifice are described. It is shown that there is no true sphincter, the vesical orifice being closed by two loops or arcs of muscles, one arising from the internal circular layer and the other from the external longitudinal layer of the bladder wall. The trigonal muscle passes in the form of an arc through the weaker arcuate muscles at the vesical orifice, and on contraction mechanically pulls them open. When the trigon is removed, micturition is difficult and incomplete. On the removal of one-half of the trigon, the remaining half functions and the bladder can be emptied completely. This is true also when the trigon is split, but the functional result is not so perfect.

The study of the pharmacology of the trigon muscle shows that it is innervated by true sympathetic fibers as it contracts on treatment with epinephrin and ergotoxin. No parasympathetic nerve endings were found to be present as there was no response to pilocarpin or atropin. The tests with nicotine gave a response indicating the presence of ganglionic structures. The bladder muscle proper gave reactions to both sympathetic and parasympathetic nerves. From the evidence of pharmacologic and embryologic studies which show an origin and a nervous control different from that of the rest of the bladder, it is deduced that the trigonal muscle contracts independently of the rest of the bladder.

The mechanism of urination was studied in a large series of cases with the cystoscope, from the urethral side and from inside the bladder through suprapubic cystotomies. In addition, endoscopic studies of the

opening and closing of the vesical orifice were made. The action of the trigonal muscle was confirmed in every instance. When viewed from the urethra the vesical orifice was found to be pear-shaped instead of circular, and showed the sluggish lateral movement of the sides of the orifice, with the quick downward pull of the base, or trigonal muscle. When viewed from within the bladder the trigonal muscle was observed to contract and the vesical orifice to open, this being followed by normal voiding.

The changes in the trigon secondary to renal tuberculosis are described and six cases showing the various stages are cited. It is found that tuberculosis may produce not only marked thickening, but also shortening of the ureter, which in turn may cause traction on the vesical end of the ureter and trigon leading to invagination of the margin of the ureteral orifice. This elevates the trigon on that side, leaving the bladder depressed around it.

Tubercle bacilli from the ureter find easy lodgment in these vesical pouches, while the greatly elevated ureteral ridge and trigon remain uninvolved. Ulceration may lead to undermining of the trigon and its separation from the bladder, as occurred in one case in which it was found floating, being attached only at the corners. In this instance it was cut loose and later removed through a cystoscope, but the patient thereafter had a small amount of residual urine. Urination is apparently normal as long as the trigon is not detached, but when the trigon becomes dissected free from the bladder muscle, micturition is less free and residual urine is present. If adhesions have been formed between the diaphragm and the kidney the shortened tuberculous ureter, on respiration, causes the trigonal ridge to play back and forth in the invaginated ureteral orifice like a piston rod.

Trigonal obstruction simulating hypertrophy of the prostate is discussed and numerous cases are described in which an obstruction at the vesical orifice caused hypertrophy of the trigon which was diagnosed as enlargement of the prostate. The trigon here acts as a great transverse dam on the floor of the bladder behind the vesical orifice which prevents the passage of urine. A diverticulum holding from 250 to 300 c.cm. of urine may be formed in cases in which the obstruction has persisted sufficiently long to cause pouch formation back of the hypertrophied trigon or an undermining of the trigon. In such a case, removal of the barrier is not sufficient to restore the normal function of the bladder as the trigon acts as a septum shutting off the flow of urine through the prostatic urethra. The valve-like effect of the undermined trigon must then be destroyed. Irrespective of the degree of hypertrophy, the force of the contraction of the trigonal muscle dissected partly free from the bladder wall is not properly applied to help in the opening of the vesical orifice.

The surgery of the hypertrophied trigon is discussed and eight detailed reports illustrating the various conditions and methods of treatment are

given. The obstruction can be attacked by the intra-urethral, perineal, and suprapubic routes. In fairly slight hypertrophies the trigon and median bar may be caught in a punch devised by Young and excised. For more marked hypertrophies Young has constructed a "cystoscopic trigonotome," to divide the trigon either through the urethra or through a perineal incision. The operation of choice in severe hypertrophy is a suprapubic cystotomy with splitting of the trigon with the scalpel or scissors. Hæmorrhage is controlled by sewing the cut edges with a continuous suture of chromic catgut.

In order that the function of the muscle may be preserved, the destruction of the muscle must be reduced to the minimum. The ideal in all cases is to restore the base of the bladder to its original condition as far as possible, removing the obstruction and its accompanying pouch, but leaving a maximum amount of uninjured trigonal muscle. The experience of the authors is that with the removal of all vesical obstructions and preservation of a maximum amount of trigon, the untoward symptoms disappear and practically perfect function is restored.

O. S. PROCTOR, M.D.

Nové-Josserand: The End-Results of the Maydl Operation for Exstrophy of the Bladder (Résultats éloignés de l'opération de Maydl pour l'exstrophie vesicale). *Lyon chirurg.*, 1921, xviii, 230.

Since 1889 Nové-Josserand has performed the Maydl operation in 4 cases of exstrophy of the bladder. The patients were boys $5\frac{1}{2}$, $11\frac{1}{2}$, $5\frac{1}{2}$ and $3\frac{1}{2}$ years of age at the time of operation. In the three first cases, which were followed twenty-one years, seventeen years, and twelve years respectively, no complication has resulted from the operation as far as the upper urinary tract is concerned and there has been no symptom of rectal irritation. Continence, though imperfect during the night, is sufficient during the day.

These end-results the author believes are interesting because they show that implantation of the bladder trigon into the intestine does not have the inconveniences which have been ascribed to it. Methods devised to prevent ascending infection are more difficult than the Maydl operation and their functional results are in no degree better. The advantages are all in favor of the Maydl procedure. There is no proof that an artificial bladder created from a segment of the intestine is more aseptic than the intestine itself.

In the author's fourth case the child died of secondary peritonitis due to the fact that when the tampon placed in the old vesical cavity was removed peritoneal adhesions were not established and infection resulted.

W. A. BRENNAN.

Lower, W. E.: Diverticula of the Urinary Bladder. *Arch. Surg.*, 1921, iii, 38.

Lower reviews the various theories regarding the several phases of diverticula of the bladder and formulates his own conclusions. As only five cases of

vesical diverticula had been reported in American literature up to 1906, the recognition and treatment of this condition are recent developments.

Engelisch has classified diverticula of the bladder into true and false types. True diverticula contain all layers of the bladder wall while false diverticula contain only the mucous membrane. Diverticula are usually located near the ureteral openings and may be single or multiple. The etiology is in dispute but it is the consensus of opinion that certain underlying congenital factors predispose to their formation, and that they are aggravated by obstruction or increased intravesical tension.

The diagnosis is made principally by means of the cystoscope, the X-ray, contrast cystograms, and cystostomy. Judd emphasizes the importance of looking for diverticula at the time of prostatectomy. The symptoms are indefinite, but persistent pyuria with urinary difficulty and frequency, especially when the urine is very foul, is sufficient to arouse suspicion as to the presence of the condition.

In the author's opinion treatment by suture of the orifice without excision (Pousson) and by enlarging the orifice (Pousson and Chute) is insufficient. The two-stage operation of prolonged primary drainage with stretching of the orifice and secondary excision is illogical. Lower's method and that used most commonly by Young, Hinman, Howard, Squier, and others is radical excision with removal of the underlying cause of obstruction. The intravesical approach is generally preferred especially for the intraperitoneal, retrovesical, and subtrigonal types. Young's suction and traction method is excellent for small diverticula; also the use of intravesical closure and extravesical drainage with prostatectomy or the punch operation, as indicated.

The author employs a vertical suprapubic extraperitoneal approach and if the diverticulum is large he converts it into a tumor by packing it with gauze. He then excises it and closes the wall in two layers, invaginating the suture line. The prevesical space is drained and an inlying urethral catheter is left in place for several days. When necessary, ureteral transplantation is done.

FRANK S. SCHOONOVER, M.D.

GENITAL ORGANS

Young, H. H., and Cash, J. R.: A Case of Pseudohermaphroditism Masculinus Showing Hypospadias, Greatly Enlarged Utricle, Abdominal Testis, and Absence of Seminal Vesicles. *J. Urol.*, 1921, v, 405.

In a young man 24 years of age the urinary meatus was at the penoscrotal juncture $3\frac{1}{2}$ in. from the bladder, and the scrotum contained no testicles. At laparotomy no testicles, prostate, or seminal vesicles could be found. A perineal drain was introduced into the bladder and a Duplay plastic operation performed to correct the hypospadias, the new urethra being made with longitudinal skin flaps reinforced with subcutaneous tissue over which the skin was drawn by means of horsehair sutures. To

relieve tension a dorsal incision was made through the skin which was drawn together transversely and the catheter was removed at the end of the operation.

The patient died from bilateral bronchopneumonia six weeks later, at which time about half the urine was passed through the new urethra, which would admit a No. 20 French catheter, and the other half through the perineal fistula. At autopsy five small fistulae were found leading to the urethral lumen. Below the lower pole of each kidney was a fold of peritoneum containing a mass which, on the right side, was 2 cm. in diameter and on the left side 4 mm. in diameter. Microscopic examination showed that the mass on the right side represented the testicle and epididymis. There was no such tissue on the left side. The utricle was greatly enlarged, displacing the right ureter to the right. On section no evidence of spermatogenesis was found. Certain sections posterior to the bladder showed a structure analogous to uterine tissue, containing a lining of stratified epithelium and columnar glands. There was some rudimentary prostatic tissue but seminal vesicles and ejaculatory ducts were absent.

This was therefore a case of pseudohermaphroditism masculinus, the organs being those of a male though much altered in morphology and function.

B. F. ROLLER, M.D.

Cecil, A. B.: One Hundred Consecutive Perineal Prostatectomies. *California State J. M.*, 1921, xix, 287.

In this review of one hundred consecutive perineal prostatectomies Cecil found that 90 per cent of the cases were benign and 10 per cent were malignant. The youngest patient was 52 years of age and the eldest 90 years and 4 months. Eighteen per cent had had trouble for ten years and 10 per cent had had trouble for from eleven to fifteen years.

Cecil states that the striking feature of the entire series was that at the time of their admission to the hospital 50 per cent of the patients sought relief on account of complete retention; 55 per cent suffered considerably with pain which was usually associated with urination or the desire to urinate or followed urination; 5 patients had hæmaturia; and 5 had incontinence of urine due to over-distention.

Preliminary treatment consisted of catheter drainage as the author does not consider suprapubic drainage advisable as a routine measure because: (1) it is an operative procedure carried out when the patient is least able to stand any type of disturbance; (2) the suprapubic space is particularly susceptible to infection; and (3) the operation immobilizes the bladder. In every instance the essentials of Young's procedure had been carried out. The drainage tube was removed on the second day and not replaced. There were two deaths, one in the benign cases and one in the malignant cases.

In 65 per cent of the cases healing occurred within less than thirty days; in 25 per cent, in two weeks or less; and in 4, between the fifth and ninth days.

In conclusion Cecil claims that the technique of Young's perineal prostatectomy offers as advantages a much lower mortality, a higher operability rate, a convalescence less than half as long as that following other procedures, and better functional results.

LOUIS GROSS, M.D.

Chatterji, K. K.: Radical Cure of a Hydrocele by Plication and Overlapping of the Tunica Vaginalis; with the Statistics of 225 Cases.
Indian M. Gaz., 1921, lvi, 209.

In 252 cases of hydrocele operated upon by Chatterji there was no subsequent trouble or

recurrence. His technique consists of exposing the sac by dissection through a 3 in. incision beginning near the spine of the pubis, then opening it by a similar incision, excising the excess of tissue, and after roughening both visceral and parietal layers, plicating and overlapping the sac and fastening both sides with sutures. By this method the anatomical relations are not disturbed and the testicle is not deprived of its natural covering. There is no troublesome oozing from the cut edges as in the excision operation, and no increased mass such as follows the operation of eversion.

B. F. ROLLER, M.D.

SURGERY OF THE EYE AND EAR

EYE

Holmes, G.: Palsies of the Conjugate Ocular Movements. *Brit. J. Ophthalm.*, 1921, v, 241.

Holmes deals with the centers controlling the ocular movements which originate above the nuclei of the third, fourth, and sixth nerves and gives in some detail the reasons for assuming the existence of such centers which are believed to control those complex movements in which both eyes participate. He shows also their relation to volitional and reflex acts in response to stimuli received through the eighth nerve (both auditory and vestibular) and the sensory nerves from the spinal column. Mention is made of physiologists who are working on the problem of conjugate eye movements particularly with reference to stimulation of parts of the brain.

Holmes seems to hold to the hypothesis which assumes the existence of a supranuclear center in the neighborhood of the nucleus of the sixth nerve. He points out a striking form of dissociation of lateral conjugate movement in which the voluntary deviation of the eyes is lost, but their reflex movements persist. Loss of upward deviation, he states, is usually associated with disturbances of the pupillary reactions to light, and that of downward movement frequently with loss of convergence and accommodation.

T. D. ALLEN, M.D.

Mosher, H. P.: Re-Establishing Intranasal Drainage of the Lachrymal Sac. *Laryngoscope*, 1921, xxxi, 492.

Mosher states that removal of the lachrymal sac stops suppuration but in 30 per cent of his cases lachrymation continued.

The author's report is based on twelve intranasal tear sac operations and twenty-five combined external and internal operations. The intranasal operation has been discarded because of the risk of orbital infection and working in a dark cavity.

The combined method has given Mosher good results. With the exception of one case—a stricture of the canaliculus—all were relieved of pus, and the epiphora began to clear up between the second and the fourteenth day, disappearing in two to six weeks. When this method is used it is necessary to have an intact punctum.

The author states that his method is a modification of the Toti operation; he calls it the Mosher-Toti operation. The essential modification is the destruction of the sac as a sac. The operation is divided into four steps as follows:

Step 1. General preparation of the patient. Removal of the anterior end of the middle turbinate.

Step 2. Exposure of the lachrymal sac, freeing it from its bed, and turning the sac and adjacent soft

tissues outward. The sac is approached through an incision over the ascending process of the superior maxilla, about 7 mm. from the inner canthus of the eye. It begins at the level of the crease in the upper eyelid and runs down nearly in a straight line parallel with the posterior edge of the superior maxilla where this makes the anterior boundary of the bed of the sac. It is stopped 2 or 3 mm. below the inner limit of the rim of the orbit. The knife is then carried through the soft tissues and periosteum to the bone. Bleeding is controlled with clamps. The sac shells out of its bed most easily if approached from above. The periosteum is elevated from the inner wall of the orbit with a flat chisel.

Step 3. A bone opening which equals the height and width of the sac is made into the nose by breaking down the lachrymal bone in front of the crest. The inner wall of the nasal duct is bitten away with a small punch to the level of the upper rim of the inferior turbinate.

Step 4. The inner half of the wall of the sac and the inner wall of the nasal duct are removed. The outer half of the sac is left because in this the common punctum is placed. Soft tissues are replaced and the skin incision is loosely sutured.

Following the operation a bandage is placed on the eye for two days, being removed temporarily to wash the eye with boric solution.

The operation can be performed under local anæsthesia, although general anæsthesia is preferable.

The author reaches the following conclusions:

Drainage of the lachrymal sac can be re-established by the intranasal operation or by the combined external and internal operation. Either operation will cure suppuration in the sac and both will lessen or abolish the epiphora. Both operations are still on trial as to the permanency of their results. The intranasal operation is a blind procedure compared with the combined external and internal operation. There is constant risk of infecting the orbit if the intranasal operation is extensive. There is little such risk if the operation is done by sight by the combined method. In long-standing cases of suppuration of the sac in which its walls are thickened and the lumen is partly or wholly obliterated the combined operation offers the best chance for success. In this very difficult type of case even the external operation may fail. If it seems unlikely to succeed at the time it is done the operator may proceed at once to the extirpation of the sac or wait to see whether or not he has successfully removed the inner wall. In such cases it is difficult to tell at the time of the operation whether this has been accomplished or not. If the operation proves to be a failure, the sac may then be excised. When an attempt

has been made to excise the sac and has failed, the external operation will readily expose what is left of the sac and any prolongations which may have developed. When fistulæ are present they may be easily dealt with by the combined operation. Excision of the sac cures only suppuration in the sac. The combined operation will do the same and greatly alleviate or cure the epiphora.

The intranasal operation on the tear sac is in great part an operation performed by touch, while the combined operation is an operation performed by sight. Experience with the external operation should make the scar as inconspicuous as the scar left by excision.

J. C. BRASWELL, Jr., M.D.

Francis, L. M.: *The Surgical Treatment of Epithelioma of the Cornea.* *Arch. Ophthalm.*, 1921, 1, 331.

Francis reports three cases in which the diagnosis of epithelioma of the cornea was made on the basis of the microscopic examination of the tissue. He describes with drawings the method of excising such epitheliomata. Usually they extend from the limbus toward the external canthus and are superficial and circumscribed. To quote the author, "Epithelioma of the limbus is usually of the slow-growing non-malignant type which in its early life remains superficial, with no great tendency to invade the deeper structures or metastasize. This type of neoplasm is favorable for surgical attack. The surgical problem is the same as for any other portion of the body: extirpation and replacement by healthy tissue."

He concludes his article with the statement that it is his desire, not to minimize the brilliant results

obtained with radium, but merely to report his experience in the surgical treatment.

T. D. ALLEN, M.D.

EAR

Allen, L. P.: *The Importance of Early Incision of the Membrana Tympani in Acute Otitis Media with Profuse Exudate.* *Wisconsin M. J.*, 1921, xx, 69.

Allen states that early incision of the membrana tympani is of importance in acute otitis media with profuse exudate as a stabbing operation is not sufficient. Spontaneous perforation also is inadequate as usually this is in the nature of a puncture and occurs anterior to the hammer handle and too low to afford proper drainage of the region of the aditus.

O. M. ROTT, M.D.

Brooks, E. H.: *When to Operate upon the Mastoid in Children.* *Wisconsin M. J.*, 1921, xx, 66.

After mentioning the influence of the mastoid structure on the progress of the infection and the uncertainty of subjective and objective symptoms as an index of the severity of infection, the author states that operation is indicated when symptoms of abscess formation have been persistent for a fortnight and local antiphlogistic measures have given no relief.

It is indicated sooner when swelling appears over the mastoid process during the first few days of the condition and when, in the absence of swelling, the rigors and symptoms of meningeal irritation appear.

O. M. ROTT, M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

New, G. B.: *The Relation of Nasopharyngeal Malignancy to Other Diagnosis.* *Minnesota Med.*, 1921, iv, 419.

In the author's review of 46 cases of malignant tumors of the nasopharynx observed at the Mayo Clinic he has been particularly impressed by the lack of nasal symptoms and the frequency with which such growths were overlooked before a correct diagnosis was made. The tumors include the sarcomata and epitheliomata but not the fibromata and myxomata. There were 22 cases of epithelioma, 14 of sarcoma, and 10 of other malignant tumors unnamed. In the diagnosis of lymphosarcoma it may be difficult for the pathologist to corroborate the clinical diagnosis without taking several specimens. The ages of the patients whose cases are reviewed ranged from 10 to 70 years; 50 per cent were between the ages of 41 and 60. Thirty-eight patients were males and 8 were females.

The symptoms varied in duration from five weeks to three years. They consisted of pain in the ear and over the face and head, gradual loss of hearing, drooping of the eyelid, diplopia, nasal obstruction, and enlargement of the glands of the neck.

Seventeen patients complained of headache, earache, and other sensations of pain which were always on the affected side and extended in general to the frontal, temporal, mastoid, or cervical regions. When the gasserian ganglion was involved there were symptoms such as pain, numbness, and tingling, over the distribution of the nerve.

Ten patients had eye symptoms such as ptosis of the upper lid, diplopia, pain about the eye, different forms of ocular palsies, and varying degrees of blindness, due to extension of the tumor into the orbit.

Ear symptoms were present in 11 cases. These consisted of fullness in, and posterior to, the ear, ringing and noises in the ear, earache, and deafness, and were caused by involvement of the eustachian tube.

Eleven of the 32 patients who had enlarged glands of the neck were operated on without discovery of the primary growth. On microscopic examination three of the growths were diagnosed as endotheliomata. A clinical diagnosis of Hodgkin's disease was made elsewhere in 3 cases. Extensive metastases sometimes occurred in the neck following a small primary growth in the nasopharynx. The upper cervical glands were always affected first, and in some cases glands on both sides of the neck were involved.

A fact especially noted by the author was that in only 24 of the 46 cases were the symptoms referable to the nose and nasopharynx. In 19 of these com-

plaint was made of nasal obstruction; in 3, of recurring attacks of bleeding; and in 2, of increasing nasal discharge. Absence of these symptoms was due to the superficial character of the growth which appeared in the vault or lateral wall of the nasopharynx. In some cases the growth appeared as a small ridge or flattened ulceration, and in others was large enough to fill the nasopharynx, bulge the soft palate, and cause pharyngeal obstruction. This was particularly true of the sarcomata.

On account of the variability of the symptoms present some of the patients had been subjected to various operations and treatments, such as extraction of teeth, treatment for syphilis, removal of the glands of the neck, paracentesis of the ear drum, intranasal operations, tonsillectomy, and operations for pituitary tumor, the presence of the nasopharyngeal tumor not being discovered.

The author particularly emphasizes the importance of making a careful examination of the nasopharynx in all cases in which any of the symptoms mentioned are present, especially when there are glands in the neck which may be malignant. Patients with neurologic symptoms referred to the eye or ear and those with intracranial symptoms should also be given a nasopharyngeal examination.

FRENCH K. HANSEL, M.D.

Ott, W. O.: *Brain Abscess Following Frontal Sinusitis.* *Surg., Gynec. & Obst.*, 1921, xxxiii, 72.

The author reports a case of brain abscess following frontal sinusitis which was observed at the Mayo Clinic. The patient, a girl 11 years of age, had had right frontal sinusitis which was gradual in onset. Pus had been evacuated. Suddenly she developed general convulsions which continued for three hours and were followed by a stuporous condition for thirty-six hours and persistent left spastic hemiparesis.

At the first operation a fluctuating mass in the right frontal area was drained. At the second operation, performed three weeks later, sequestra were removed from the right frontal bone. The dura was not perforated. At the third operation performed one month later following several Jacksonian convulsions on the left side, more sequestra were removed.

Three months later the symptoms returned and, in addition, choked discs of four diopters were noted. The fourth operation at this time revealed an abscess about 2 in. below the surface under the outer part of the right frontal lobe which contained 3 oz. of pus. After irrigation, two rubber drainage tubes were left in place. Recovery was rapid. One drainage tube was removed. The other, which was gradually shortened, slipped out one night when the

dressings came off. Recurrence of symptoms followed. On reinsertion of the tube, pus was drained off and the symptoms were quickly alleviated. Subsequently, recovery was uneventful.

Brain abscess is apt to develop in conjunction with osteomyelitis of the skull. Thorough drainage is advisable during the quiescent stage. The author emphasizes the importance of leaving the drainage tubes in place instead of frequently withdrawing and reinserting them. They may be safely removed when the purulent drainage ceases and there is drainage of only a slight amount of ropy, mucilaginous material. This stage is reached in from one to three months after the operation.

O. S. PROCTOR, M.D.

Moure, E. J.: Recent Progress in the Surgery of the Accessory Sinuses. *Laryngoscope*, 1921, xxxi, 479.

The author calls attention to the fact that although great progress has been made in the surgery of the accessory sinuses, methods advocated by Desault early in the nineteenth century are still in use.

In surgery of the maxillary sinuses the older methods of removing a molar tooth and draining the sinus have been discarded for more modern methods. The Caldwell-Luc operation gives excellent results when properly carried out. By this procedure an ample opening is made into the maxillary sinus through the canine fossa to curette, sponge, and disinfect, and to form an opening between the corresponding nasal fossa and the cavity operated upon. In the author's opinion, Denker's method of entering the maxillary sinus through the pyriform opening has no distinct advantage. A careful curettage and removal of all fungus growths and of the mucosa lining the walls of the sinus are the means of obtaining an occlusion of the latter through a fibrous cicatricial tissue which will permanently prevent recurrent infection. Such a procedure is desirable.

The surgical treatment of fronto-ethmoidal sinusitis has progressed through many changes. Moure states that in order to cure frontal sinusitis and prevent its recurrence it is necessary to eradicate the cavity. The ethmoid is approached by the endonasal route so that when the frontal sinus is opened all that remains to be done is to enlarge the nasofrontal canal at the level of the infundibular region to assure free drainage of the sinus operated upon. The modification of the Ogsten-Luc operation Moure believes is less mutilating and furnishes excellent drainage. A rather large bony opening is made at the level of the frontal boss in order that the whole frontal cavity may be inspected and curetted completely. In case removal of a part of the frontal bone is greater than anticipated, the largest part is closed by means of an osseous flap removed from the portion of the frontal bone adjacent to the site of operation. In this way deformity is avoided, especially if the skin incision has been made along the line of the previously shaved eyebrow.

Surgery of the sphenoidal sinus has not made the same progress as that of the other sinuses. This may be due to the fact that the sphenoidal sinus is less often invaded and the diagnosis is not so easily established. The sinus has generally been reached by the endonasal route.

In pansinusitis the author believes it best to consider the Rouge operation as this procedure makes it possible to examine the entire skeleton of the face.

In conclusion Moure states that local anaesthesia should be employed for operations upon the maxillary, ethmoid, and frontal sinuses.

J. C. BRASWELL, JR., M.D.

THROAT

Kay, M. B.: Subcutaneous Emphysema Due to a Ruptured Larynx in an Untreated Case of Diphtheria. *J. Michigan State M. Soc.*, 1921, xx, 240.

Kay reports a case of neglected diphtheria in an 11-year-old patient who was seen on the fourth day of the illness when the pharynx was filled with a gangrenous-looking mass. The following day the patient was in shock and a subcutaneous emphysema involving the entire chest, the arms, and the neck up to the chin level was discovered. Dyspnoea and cyanosis were marked. A tracheotomy was performed, but death followed.

The author believes the emphysema was due to rupture of the larynx caused by some erosive process, probably gangrene, although up to a short time before death there was no evidence of laryngeal involvement.

O. M. ROTT, M.D.

MOUTH

Ombrédanne, L.: Correction of the Buccal Commissure in Facial Paralysis (Correction de la commissure buccale dans la paralysie faciale). *Presse méd.*, Par., 1921, xxix, 636.

The various surgical measures which have been devised to correct the deformity of the buccal commissure following facial paralysis have the disadvantage that they leave a scar which is almost as disfiguring as the original condition. In a recent case Ombrédanne has obtained an excellent æsthetic result from the use of a dental hook which is fixed to a tooth in the region of the deformity and holds the commissural extremity in the correct position. The entire apparatus is removable and does not interfere with mastication.

W. A. BRENNAN.

New, G. B., and Hansel, F. K.: Melano-Epithelioma of the Palate. *J. Am. M. Ass.*, 1921, lxxxvii, 19.

In a thorough review of the literature, 24 cases of melano-epithelioma of the palate were collected. One additional case was observed at the Mayo Clinic. The first case was reported by Weber in 1859.

Melanotic tumors have been variously classified, but Broders and MacCarty prefer to use the term

"melano-epithelioma" whether the tumor occurs in the mucous membrane or in the skin, as they believe that the pigment-bearing cells arise directly as a proliferation of the germinative cells of the skin or the cells of the parenchyma of some organ.

Melano-epithelioma, particularly the type originating in the skin, eye, eyelid, mucocutaneous surfaces of the vulva and anus, penis, ovary, epididymis, and pineal gland, arises in pigment-bearing cells. It is fairly common in the anorectal region of horses where the tissues are pigmented. The mucous membrane of the human palate is non-pigmented; some animals have non-pigmented palates, but others normally have dark palates.

In 6 of the 25 cases of melano-epithelioma of the palate areas of pigmentation were noticed previous to the appearance of the tumor. In 1 case the pigmentation appeared after an injury by a pipe stem, and in another, following injury by a dental plate. Practically all of the patients complained only of the presence of the tumor. However, symptoms of pain, dysphagia, hæmorrhage, and difficulty in speaking and chewing were present in some of the cases. In 14 patients the cervical glands were involved at the time of the first examination.

The duration of symptoms varied from one month to four and one-half years. The average duration was fifteen months. Seven of the patients were females and 18 were males. The youngest was 24 years of age, the oldest 84. The average age was 54 years.

Sections of the tumor showed both pigmented and non-pigmented areas. The melanotic infiltration

seems to be a protoplasmic elaboration of the cell. Soon after pigmentation appears, the cell, which is fusiform at first, soon becomes globular and so black that the nucleus is invisible. Finally the cell outline becomes indistinct and a small ball of pigment remains. The balls disintegrate and the tumor becomes a blackish mass.

Microscopically these tumors show an alveolar arrangement of spindle and oval cells, and occasionally giant cells. Some of the cells are pigmented and some are not. Metastatic growths may be pigmented or non-pigmented. The latter is especially true of early metastasis.

The diagnosis is based on the presence of a pigmented, nodular, somewhat pedunculated tumor which is usually soft in consistency and vascular. The glands of the neck become involved early by metastasis, and later a general melano-epitheliomatosis may occur. An early melano-epithelioma may be confused with other forms of pigmentation, such as that following small hæmorrhagic areas in the submucosa in certain blood dyscrasias and that of lead or bismuth poisoning.

Rapidly growing melano-epitheliomata are considered the most malignant type of neoplasm.

Seventeen of the 25 patients were operated on, the remaining 8 being considered inoperable. Since many of the 25 cases were reported shortly after operation, it is not possible to give a prognosis with regard to the end-results. It is evident, however, that surgical intervention or the application of radium, either locally or over the neck, is usually futile.

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SURGERY OF THE EYE AND EAR

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1921

ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Turner, P.: The Principles of Preventive Surgery.
Guy's Hosp. Gaz., Lond., 1921, xxxv, 323.

The author discusses the application of the ideals of preventive medicine to surgery. Preventive surgery includes the prevention of surgical diseases, deformities, and disablement and the investigation of the causes, points of origin, earliest signs and symptoms of disease, and the complications and sequelæ of surgical treatment, including operation. It aims also at improvement in surgical technique and methods which will lead to more rapid and complete recovery. The author discusses the application of these principles to different diseases and conditions.

FREDERICK CHRISTOPHER, M.D.

Blair, V. P.: The Delayed Transfer of Long-Pedicle Flaps in Plastic Surgery. *Surg., Gynec. & Obst.*, 1921, xxxiii, 261.

On the basis of extensive experience in the making and transplanting of cutaneous flaps for the correction of superficial defects Blair draws the following conclusions:

1. About the neck and face of a healthy man, regardless of his age, long flaps can be made with little danger to their vitality if the return circulation is not obstructed by gravity or kinking or torsion of the pedicle. In women and children, whose circulation is less vigorous, they are less apt to survive.

2. A longer flap can be raised or the flap can be cut narrower and thinner if it is raised and sutured back in its bed, the transfer being delayed six days to two weeks.

3. If sloughing occurs, the area lost is less than if immediate transplantation is done.

4. Sloughing of an untransplanted flap is superficial. That which occurs after transfer generally involves the full thickness.

5. If a transplanted flap is in danger of sloughing, it should be placed back in its original bed. In this manner time and a larger part of the flap will be saved.

6. When a flap is to be split into narrower flaps, the splitting should be delayed until the time of transplanting or some intermediate time.

7. In a neck flap including part of the clavicle for a pedicled bone graft the softer tissues gain firmer attachment and the bone will be more resistant to infection if the transfer is delayed.

8. A blood clot under a flap may be fatal to it and should be prevented by pressure dressings and the use of multiple drains. These should be removed after twenty-four hours.

9. A raw surface exposed on the pedicle after transplantation is more resistant to infection after delayed transfer.

10. If any part of a flap sloughs while it is in its original bed it should not be transplanted.

11. An apparent rather than real disadvantage of this method is the necessity for two operations. Two properly planned operations, however, may bring success while a single operation may result in failure.

12. Delayed transfer is not universally successful.

Some very instructive and admirable sketches and photographs help materially in bringing out the author's points.

C. CORBIN YANCEY, M.D.

ANÆSTHESIA

Eastman, J. R.: The Psychic Element in Anæsthesia. *Ohio State M. J.*, 1921, xvii, 533.

Eastman attempts to show that in psychic domination we have an invaluable adjunct in anæsthesia, especially regional anæsthesia, and that its more extensive employment would contribute to the improvement of surgery and the common welfare.

It is always desirable and, as a rule, possible, to impart to the patient at the first meeting an enlivening sense of security, to allay, to some extent, any phobias and delusions, and to establish confidence. The most successful surgeons instinctively adapt themselves in voice and manner to the needs of the patient before

them. This natural gift is without doubt a great secret of success.

In the operating room the patient should find all those conditions which conduce to a quiet, tranquil mood. This embraces many things; for example, the temperature, which should be so gauged as not to attract notice, being neither uncomfortably low or annoyingly high. The illumination, if mellow, conduces to tranquillity. A strong light, even if natural sunlight, is not always a good light, and intensely brilliant illumination annoys the patient as well as the surgeon. What is needed is illumination, i.e., light controlled and directed. In artificial illumination blue glass surrounding the source of light, correctly directed, provides a soft, white, diffused artificial sunlight which is most agreeable to the surgeon and patient. An atrocity of the operating room is the glaring white wall. The soft, flat, light gray of the sky, if used on the walls without gloss or varnish, contributes to a restful mood.

The ventilation of the operating room should receive attention. Fresh air in abundance is a vital necessity. Obviously leaning upon the patient's chest as practiced occasionally by operator and assistants during general anaesthesia would be intolerable to a conscious patient. The same oppression may be caused by allowing many heavy artery clamps to remain on the neck or chest.

If the table is not made soft by pillows complaint will be made of discomfort. This can be corrected without in any way impairing the aseptic technique. Another source of annoyance and irritation to the patient is noise. The dropping of a pan, the clanging of instruments, or the blowing off of an autoclave during regional anaesthesia is most disturbing. Talking in the operating room should be kept at the minimum but engaging and diverting conversation between the patient and a low-voiced nurse or assistant may be helpful.

In Eastman's experience it is undesirable to question the patient at frequent intervals as to what pain is being perceived. This applies especially to suggestible persons. Pain perception may be created by suggestion. It is much better to lead the patient into channels of thought remote from those of pain by the artful employment of apparently impromptu remarks upon subjects quite foreign to the operation or by declaring that the pain is disappearing. With suggestible persons the mere reiteration that there is no pain aids anaesthesia. It is of importance also that the surgeon should show no anxiety or concern as this would alarm the patient. Complimenting the patient upon his display of courage and confidence is of value. Reassurance under some circumstances may amount to deception, but this is justifiable and moreover agreeable to the patient.

Recourse to music as an aid in obtaining the tranquil mood in the operating theater and, for the patient, the gentle abstraction so desirable in surgical undertakings upon conscious persons was suggested by the expressed wish of patients and is feasible if it will not

turn the operator's thoughts from the matters with which he is engaged. It can hardly be doubted that music influences the emotions, stimulating, depressing, soothing, irritating. It is surely true that music induces psychic and physiological reactions and that it affects the respiratory, circulatory, and nervous systems. If music in an adjoining room induces mental repose and nerve and muscle relaxation on the patient's part, it is not absurd to make use of it, providing it does not distract the thoughts of the surgeon or his aids.

ISABELLA C. HERB, M.D.

Jaeger, H.: Death under Ethyl Chloride Anaesthesia (Tod im Chloraethylrausch). *Zentralbl. f. Chir.*, 1921, xlviii, 1073.

In the removal of a section from a malignant tumor of the lower extremity in the case of a man 40 years of age ethyl chloride anaesthesia was induced according to the method of Kulenkampff. The patient was slowly counting to ten and the anaesthetist had given ninety drops of the anaesthetic when there was a sudden generalized tremor of the patient's body followed by cessation of respiration. Death occurred in spite of immediate artificial respiration with the administration of oxygen, subcutaneous injections of camphor, intravenous injections of digalen, and an intracardial injection of 1 c.cm. of adrenalin. The author states that the eight layers of gauze showed no icing and that the Swiss preparation had been used without ill effects in many hundreds of cases. Investigation showed that ninety drops of the anaesthetic amounted to scarcely 2.5 c.cm. No other narcotics had been given previously. An error of technique probably can be excluded.

Autopsy showed flabby fatty degeneration of the heart muscle, a small pneumonia focus in the lower lobe of the left lung, extensive swelling and partial calcification of the retroperitoneal paravertebral lymph glands, hypoplasia of the suprarenals, a large area of yellow softening in the right parietal lobe of the brain, and no thymus persistency. The patient had probably been drinking excessively previous to the operation.

Clinically only the heart was considered as pathologic, there being dilatation 1 cm. to the left with mild cyanosis. The heart tones, however, were clear and the heart action was regular. According to Kulenkampff, ethyl chloride death is always a cardiac death. In the case reported the fatty degeneration of the heart muscle, the alcoholism, the small focus of pneumonia, the cerebral softening, and the glandular caseation were conditions causing cardiac embarrassment. In suspicious cases of cardiac degeneration and in alcoholics even the simple ethyl chloride "rausch" should be given very carefully.

The author's case and Renner's similar case do not speak against the employment of ethyl chloride anaesthesia, but only against the recent general opinion regarding the absolute harmlessness of the anaesthetic. Every anaesthetic has its dangers. Ether is probably the safest.

TOELKEN (Z).

Holm, G.: Accidents During Paravertebral Conduction Anæsthesia in the Neck in Goiter Operations (Ueber unglueckliche Zufaele bei paravertebraler Leitungsanaesthesia am Halse bei Strumaoperationen). *Acta chirurg. Scand.*, 1921, liii, 561.

The author reports the case of a 15-year-old girl he operated upon for congenital goiter. Each lateral lobe was about the size of a fist and the isthmus about the size of a goose egg. To induce paravertebral novocaine anæsthesia, Holm injected at about the level of the third and fourth transverse vertebral processes on each side 10 c.cm. of a 1 per cent novocaine-adrenalin solution. After the introduction of the needle, it appeared to be directed too far downward as the patient complained of pain in the left arm. It was therefore withdrawn and re-introduced at the level of the fourth transverse process. About 3 or 4 c.cm. of the solution were then injected. Almost immediately the face muscles became stiff, the mouth drawn, and respiration weaker. After a few seconds, violent and sudden clonic convulsions developed in the muscles of the neck and extremities and marked contractions occurred in the face muscles. The condition closely resembled an epileptic attack. As the heart action and respiration then practically ceased, death was expected. The patient was revived, however, by artificial respiration. The entire attack from its onset to the restoration of breathing lasted perhaps a few minutes. The patient had entirely recovered after one or two hours and has had no further attacks. There was no epilepsy in her history.

Meyer has reported similar convulsive attacks in the cases of two patients operated upon for goiter by the conduction anæsthesia method.

Bruett describes the case of a 35-year-old woman on whom he operated for goiter. After the injection of about 140 c.cm. of a $\frac{1}{2}$ per cent novocaine solution, the patient's breathing became suddenly shallow and the pulse rapid and weak. Death ensued.

A case reported by von Weimann was that of a 29-year-old woman in whom he induced bilateral paravertebral anæsthesia according to Haertel's method.

In addition to 14 c.cm. of a 1 per cent novocaine-adrenalin solution injected in the vertebral region, he injected subcutaneously 20 c.cm. of a $\frac{1}{2}$ per cent solution. As in the other cases, circulatory and respiratory disturbances were soon noted, and in spite of stimulants and artificial respiration death followed. Postmortem examination showed a small hæmatoma on both sides (injection hæmatoma), the one on the right side being against the vagus nerve and the upper cerebral ganglion, while that on the left side was in contact only with the vagus nerve.

The author does not consider injury to the vagus as the most probable cause of the disturbances in his case as the symptoms were not identical with those due to vagus irritation. In no cases of vagus-nerve injury have general convulsions been reported, and in the author's case these were the predominating feature. Moreover, the convulsions developed before cyanosis and so rapidly that carbon-dioxide irritation of the cortex could hardly be considered a cause.

On the basis of experiments made by Meyer on animals and his own case, the author is of the opinion that the complication was due to intravascular injection. Bruett is rather of the opinion that the unfavorable results in his case were due to the toxic effect of the morphine-scopolamine given before the operation and of the novocaine given for anæsthesia.

Von Weimann attributed the deaths in his cases to vagus irritation. Holm states that if this theory were correct the hæmatomata must have become sufficiently large to cause fatal pressure in three minutes, but they were only of pigeon-egg size. Holm believes, therefore, that in these cases the vagus nerve might have been rendered functionless by the effects of the novocaine rather than by vagus irritation.

In order to avoid unpleasant occurrences during paravertebral anæsthesia, the author recommends:

1. Slow injection and repeated aspiration to avoid entering the blood vessels.
2. Directing the needle point about 1 cm. backward when it comes into contact with the transverse process from the side in order to avoid both large vessels and nerves.

W. H. MEENTS, M.D.

SURGERY OF THE HEAD AND NECK

HEAD

Eliasberg, W.: Traumatic Epilepsy and Its Treatment (Zur traumatischen Epilepsie und ihrer Behandlung). *Deutsche med. Wchnschr.*, 1921, xlvii, 707.

On the basis of his own experience and that of others in the treatment of traumatic epilepsy, the author comes to the following conclusions:

In an entire series of cases of traumatic early or late epilepsy, medical treatment with perhaps cold applications (Spielmeyer) was sufficient if the attacks appeared only when bromides or luminal were not given or occurred more or less regularly at intervals

but showed no tendency to become worse. When once the status epilepticus has developed Eliasberg advises operation. It appears that in status epilepticus the epileptic changes in the brain are very much worse. Any bony covering must then be removed and all scars extirpated. Under all circumstances one must be on guard for cysts.

The prognosis of traumatic epilepsy associated with brain injuries is always serious. Even after three, four, or more years of relatively good health, severe attacks may occur following a light infectious disease or even without any apparent cause due to the brain injury. If the surgical wound healing occurred some time ago and the wound has become

completely quiescent it is well to take into account the following points after having considered paresis, hemianopsia, and other features:

1. The type, duration, and course of the epilepsy; the danger to life from injuries which might be incurred during the spasmodic attacks; and the danger to life from progress of the condition (status epilepticus is of especial significance in this connection).

2. Subjective difficulties.

3. Social results due to character changes.

4. Psychophysical functional capacity.

On the basis of these points comparatively high compensation for damages resulting from traumatic epilepsy will be obtained. It should be emphasized, however, that frequent subsequent investigations are necessary and that even subjective progress of the condition without apparent signs at the time of the examination may warrant an increase in compensation.

Borr (Z).

Schamoff, W. N.: Brain Abscess and Encephalitis Following Injuries to the Skull (Hirnabscess und Encephalitis nach Schaedelverletzungen). *Manuscript*, 1920.

The author, who touched upon this theme at the Fourteenth Congress of the Russian Surgical Society in Moscow in 1916, reports in this article thirty-two cases of abscess of the brain from the Fedoroff Clinic, twenty-two of which ended fatally and only ten in recovery. He has come to the following conclusions:

1. After brain injuries the meninges are pressed against the margin of the bony defect as the result of an increase in intracranial pressure. In this way the formation of adhesions is favored by which the sub-arachnoid space is protected against the advancing bacteria.

2. Brain abscesses generally run a course devoid of highly alarming symptoms, but tend to progress along the lymph passages in the direction of the ventricles. The encroachment of the infectious process upon the ventricles leads to basilar meningitis which runs a violent course and as a rule is fatal.

4. When operation is performed a relatively good prognosis can be given in cases of abscess and encephalitis if the condition is superficial. On the other hand, the deep brain abscess almost always perforates into a ventricle and causes death.

5. The usual drainage material is to be rejected in brain surgery. It does not allow sufficient discharge and causes too great trauma. Strips of gutta-percha or cigarette drains should be employed.

6. As little tissue as possible should be sacrificed at operation. The protective adhesion must always be spared and preventive measures should be taken against infection of the cerebral walls. To this end the infected skin wound and the margins of the necrotic bone must be removed. The dura mater should be exposed by a circular incision which takes in at least $\frac{1}{2}$ cm. of the healthy tissue. This exposure must be done cautiously. Deep splinters of projectile or bone must not be sought for. Manipulations should be restricted to the minimum. Hesse (Z).

Swanberg, H.: Gunshot Injuries to the Brain.

Am. J. Roentgenol., 1921, n.s. viii, 445.

Since non-fatal cases of foreign bodies in the brain are rather infrequent and medical literature is scant regarding the end-results in groups of cases observed for many months after the initial trauma, the author believes it worth while to report eleven cases which he was able to follow up during his service at one of the army hospitals. He gives a minute description of the methods he used to determine the depth of the foreign body from the skin and its relationship to anatomical structures and reports the complete histories together with the roentgen and neurological findings. He sums up his findings as follows:

In four of the eleven cases the foreign bodies were removed. Three of these patients died from meningitis on the third, fourth, and eighth days respectively following the operation, making the operative mortality 75 per cent. Of the eight who are living, seven still retain the foreign bodies in the brain and five of these have attacks of Jacksonian epilepsy. Of the two who are not so affected, one complains of occasional severe head pains. The foreign body in the other case is extremely small, the smallest in the series. As the first Jacksonian convulsion did not occur in one of the cases until fifteen months after the injury, these men may yet develop this condition as only sixteen and nineteen months respectively have passed since their injury. The one patient who lived following the removal of the foreign body has had no convulsions. All the patients except one complain of headaches or vertigo, usually the latter. About half of them occasionally have paræsthesia in the formerly paralyzed parts, although in the majority the paralysis itself has disappeared. The general health of most of the patients is fairly good.

In no case does the foreign body appear to be causing any special symptom or symptoms because of its particular anatomical location. In other words, as far as could be ascertained, the function of that portion of the brain in which the foreign body is located is not disturbed by its presence. The symptoms complained of are in general those which are present in practically all such cases. Any special symptoms are due to the traumatized portion of the brain through which the foreign body passed in reaching its final resting place. ADOLPH HARTUNG, M.D.

Anton, G., and Voelcker: The Venous System in the Brain and Brain Disinfection (Ueber die Venenwege im Gehirn und ueber Gehirndesinfektion). *Jahrb. f. Psychiat. u. Neurol.*, 1921, xl, 415.

The venous system of the brain and the liquor cerebri are closely associated. There are many connections between the veins and venous systems and between these and the ventricles. The communications of the venous systems inside and outside of the rigid skull are numerous. The vessels of the diploe are connected with both the sinus venosi and the meningeal veins. As they open into the pacchionian depressions, the liquor cerebri may here pass into the veins directly.

There is one area in the brain to which all the large venous sinuses and also the vena Galeni bring their blood, i.e., the confluens sinuum. This is clearly recognizable in the roentgen picture and can be determined also craniometrically. In the cadaver the authors were easily able to sound the individual sinuses from this point outward. Experiments with fluid metal injections and roentgen photography have shown, among other things, that the veins of the trunk and the ventricles communicate with the veins of the surface of the cerebrum not at all or to only a slight extent. This suggested the possibility of disinfecting the brain by injecting solutions into the desired portion of the vein.

The choice of solution to be used for this purpose was difficult and dangerous. A suitable disinfecting fluid is claimed to have been discovered by Pregl (Graz) in what may be described briefly as an iodine solution which is isotonic for the blood. Preliminary experiments have given good results, and already an injection has been made into the sinus longitudinalis with a not too thin hollow needle. This injection was borne as well as those made into other parts of the body and did not cause thrombosis.

WEICHERT (Z).

Dandy, W. E.: An Operation for the Removal of Pineal Tumors. *Surg., Gynec. & Obst.*, 1921, xxxiii, 113.

Tumors of the pineal body have rarely been diagnosed. The total number of authentic pineal tumors is less than one hundred and almost all have been found accidentally at autopsy. It is now possible to make a correct diagnosis of a pineal neoplasm or at least to determine that the lesion is restricted to the mesencephalon.

The author has performed his operation upon three cases, and the results of one case at least have demonstrated not only the feasibility of the removal of such tumors, but also the absence of injurious effects.

Cases of tumors of the pineal body can be helped by only one form of therapy, i.e., operative removal. Any treatment which is less than this is of no value. The symptoms which bring the patient to the physician are invariably those of intracranial pressure due to an internal hydrocephalus caused by occlusion of the aqueduct of Sylvius over which the tumor is situated. Other signs of local character follow the direct pressure of the tumor upon the corpora quadrigemina and the structures in the mesencephalon. No palliative benefits can possibly accrue from a decompression or a puncture of the corpus callosum.

The essential features of the author's procedure are: (1) craniotomy through a large parieto-occipital bone flap, preferably on the right side; (2) release of the fluid in the lateral ventricle by trocar puncture; (3) ligation of the cerebral veins; (4) retraction of the brain (cerebral hemisphere) to one side; (5) splitting of the corpus callosum; (6) ligation of the inferior longitudinal sinus if necessary; (7) division of the falx cerebri, if necessary; and (8) enucleation of the tumor.

FREDERICK CHRISTOPHER, M.D.

Shelden, W. D.: Tumors Involving the Gasserian Ganglion. *J. Am. M. Ass.*, 1921, lxxvii, 700.

The author reports four cases of tumor of the gasserian ganglion observed by him at the Mayo Clinic. The first patient was a man, aged 26, with a history of tuberculosis of the right knee. He was seen eighteen months after the appearance of the initial symptoms of pain in the right cheek and in front of the right ear which was almost constant and occasionally became severe. For one month before examination, he had noted numbness of the right side of the tongue, chin, and right cheek and that his voice had developed a nasal quality.*

The general examination was negative except for the discovery of enlarged glands under the jaws which microscopic examination showed to be tuberculous. The right pupil was smaller than the left. Convergence reactions and fundi were normal, as were the ocular movements, but there was a slight ptosis of the right lid and practical absence of the right corneal reflex. Sensation of touch was lost over the chin, impaired over the right cheek, and normal over the forehead on the right side. Recognition of the head and point was lost over the chin and cheek and much impaired over the forehead. Temperature sense was most impaired over the chin, but not abolished; it was impaired, but less impaired than pain sense, over the cheek and forehead. This dissociation remained constant.

At operation a spherical tumor 1 cm. in diameter was removed from tissue around the ganglion. Sections showed this growth to be an endothelioma. After operation the pain ceased for one month, then returned, and in spite of alcohol injections, remained constant until death occurred about a year and a half later.

The second patient, a woman aged 45, gave a history of a blow on the head six months before observation and of tinnitus in both ears, especially the left, for two or three years. For one and one-half years before examination at the Clinic she had constant severe pain in the left cheek, and two months before observation had become hoarse. Epileptiform attacks had been of frequent occurrence.

Examination revealed complete paralysis of the left external rectus, slight ptosis, reduction of pupillary reaction to light, and a normal fundus. The left vocal cords were paralyzed, the left sternomastoid was weak, and the left half of the tongue was markedly atrophic. At operation, a portion of the tumor was removed and the fifth posterior root was cut. Temporary relief from pain followed. Sections of the tumor showed endothelioma. The symptoms continued until death seven months after the examination.

The third patient was a woman, aged 47, with a history of constant pain for eleven months before observation. She had a convergent strabismus of the left eye of six months' duration.

Physical examination showed diminution of vision of the left eye, paralysis of the left external rectus, and impairment of the ocular motions. Anesthesia

of the face was absent; touch with cotton was somewhat painful. The left ear showed profound nerve deafness. Atrophy of the left side of the tongue and weakness of the left sternomastoid muscle were also noted.

At operation the site of the ganglion was found to be occupied by a tumor. A portion of the growth which was removed showed it to be an endothelioma. Section of the posterior root gave freedom from pain for a year, but later symptoms developed which were compatible with progression of the growth along the middle and posterior fossæ.

The fourth patient, a man of 28 years, had had convulsions at 2 years of age and a convergent strabismus of the left eye when he was 4. After operation the condition changed to one of divergent strabismus. Three years before examination at the Clinic he had optic atrophy of the left eye and neuritis of the right eye. When the patient was first seen by the author the left eye could only perceive light and there was visual impairment in the right eye. Eleven months previously he had a burning sensation in the right cheek, the right side of the tongue, the face, and the forehead of the scalp. This was followed later by vertigo and impairment of gait.

Examination showed bilateral secondary optic atrophy, divergence of the left eye, and uniform loss of sensations of touch, pain, and temperature over the distribution of the fifth nerve on the right side. A tumor above, but involving, the ganglion was found which on microscopic examination was shown to be a glioma. Removal of the tumor was followed by improvement. Three and one-half years later there was no evidence to indicate a recurrence.

The author notes that sudden paroxysms of pain are infrequent and uninfluenced by external irritation. Tumors involving the ganglion showed various evidences of penetration of the middle and posterior fossæ. The dissociation of sensations in the branches of the fifth nerve is noteworthy.

The gasserian ganglion may be involved also by tumors arising primarily in the nasopharynx, and these tumors, usually epitheliomata, may not cause symptoms until after penetration of the skull. The difference between the nasopharyngeal group of cases and the group in which the tumor arises primarily within the cranium is that the former allow only palliative radium therapy, while the latter are treated surgically. G. H. JACKSON, JR., M.D.

Esser, J. F. S.: A Plastic Operation on the Nose Without a Skin Incision (Nasenplastik ohne Hautschnitt). *Deutsche Ztschr. f. Chir.*, 1921, clxiv, 211.

For the treatment of saddle nose which is so sunken and fixed by scar tissue that it cannot be corrected by the ordinary methods of bone transplantation, and for the correction of marked deformities following lues, lupus, and gunshot wounds in cases in which there is a wide bridge of skin extending from the left to the right cheek, the author recommends his nose plastic procedure without a skin incision as a substitute for the usual operative procedures.

Entrance to the interior of the nose is gained through the mouth by cutting through the roof of the fornix near the incisor and canine teeth. The nasal septum, if present, is divided with the shears, the upper lip and nose are lifted up, and the cheek is separated from the underlying structures by sharp and blunt dissection. The sunken nose and the adjoining cheek tissue are then lifted with Langenbeck retractors and an impression of both sides of the face adjacent to, and including, the nose is made with dentist's wax.

After this impression has been hardened, it is covered with a single large Thiersch graft with the cut side out and in such a way that the middle of the flap corresponds to that part of the model which goes ahead when the model is inserted. This skin-covered model is then introduced into the nose area and, if possible, the incision in the fornix is sutured preferably with metallic suture material. If suturing is not possible, the model is fixed in position by means of two strong metal sutures which are passed through the upper lip just above the angle of the mouth and fastened to metal plates or buttons.

After eight days the suture and the model are removed. The wound has been in contact with the Thiersch graft on all sides and the transplant has healed in place as far as the area where the model lay free in the nose and mouth cavity. This space is then tamponed with gauze for one or two days. The nose is then supported by means of a temporary prosthesis which allows nose-breathing. This prosthesis is fastened to the teeth and led over the upper lips into the nostrils, or is attached to a head bandage. From one to two months later a permanent support is formed by means of bone grafts or a dental prosthesis is inserted through the fornix opening.

During the entire after-treatment care must be taken that the nose does not sink in as the result of shrinkage. This should be prevented by the prosthesis. In serious nose defects substitution must be made also for other missing portions.

The author gives the histories and numerous pictures of nine cases treated by the method described. He states that cartilage transplants heal in more easily than bone and if suppuration develops are seldom sloughed out. However, in one case reported a large part sloughed away. Emphasis is laid on the fact that the transplantation is made just under the surface of the skin in order as much as possible to avoid infection from the nasal cavity. RHODE (Z).

NECK

Wilson, L. B.: Malignant Tumors of the Thyroid. *Ann. Surg.*, 1921, lxxiv, 129.

This article presents an analysis of the pathologic data concerning 290 patients with malignant tumors of the thyroid who were examined in the Mayo Clinic between January 1, 1901, and January 1, 1921. Photomicrographs illustrate the various histologic types of tumors, and the clinical course of the disease in cases of the various types is discussed in connection

therewith. The following is a summary of the principal points brought out:

1. Malignant tumors of the thyroid are much more frequent than is generally believed. Their correct clinical diagnosis is frequently missed: (1) because they may have periods of development of from five to fifteen years and patients are not followed up long enough after operation, and (2) because not infrequently the tumor in the thyroid itself is relatively small and the character of the metastasis is not determined because of the rarity of autopsies.

2. Pathologic diagnosis is difficult because of the variation in the histology of the tumor tissue and its resemblance to that of non-malignant processes.

3. There has been a marked failure of American surgeons to report their cases of malignant tumors of the thyroid in the literature. This should be corrected.

4. Insufficient observations are at hand for determining the geographic incidence.

5. At the date of diagnosis the incidence of malignant tumors of the thyroid is greatest in the fifth decade of life.

6. The distribution by sex is about one man to two women.

7. Patients usually seek medical advice on the occasion of recent rapid growth in a long-standing nodular tumor of the thyroid. Some give histories of slow continuous growth.

8. Early thorough operations give a fair percentage of cures. Palliative operations are warranted in late cases with extensive local involvement.

9. The pathologic diagnosis must take into account the usual development of malignant tumors of the thyroid from proliferating embryonic adenomata.

10. The pathologist must be thoroughly familiar with the various characteristics of proliferating adenomata, as first described by Langhans, in all their stages.

11. The pathologist must be on the lookout for the possible relationship of bizarre metastatic growths of tumors of the thyroid.

12. In his diagnosis for the guidance of the surgeon, the pathologist must consider the relative preponderance of proliferative and degenerative processes in the tumor, but a proliferating adenoma in a patient of cancer age should not be considered benign unless the process of degeneration is very extensive and thoroughly overbalances that of proliferation.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Shipley, A. M.: *A Consideration of 190 Chest Injuries.* *Am. J. Surg.*, 1921, xxxv, 221.

The author summarizes his impressions of chest surgery gained while Surgical Director of Evacuation Hospital No. 8 during five major offensives with the American Army, and reports in detail regarding 190 chest injuries cared for by this unit during the Argonne-Meuse offensive. The cases are classified in five groups as follows:

1. Injuries of the chest wall only, without opening the pleural cavity, treated by débridement as in wounds of soft parts and bone elsewhere.

2. "Sucking wounds," injuries of the chest wall opening into the pleural cavity. These patients were cyanotic, dyspnoëic, anxious, and uncomfortable, and had a rapid irregular pulse of low tension. Débridement and plugging or suturing the opening was followed by decided improvement.

3. Extensive wounds of the chest wall including a penetrating or perforating wound into the thorax. The scapula and one or more ribs were often injured and if the wound was caused by shell fragments, clothing was carried in and the wound was badly infected. Radical débridement of the chest wall with removal of bone fragments and foreign bodies was indicated. The pleural cavity was rendered as dry as possible and tightly closed to prevent mediastinal flapping. The operations on the lung at the same time varied with the operators and the question is still unsettled.

4. Cases of slight injury to the chest wall in which a large piece of shell casing remained in the lung.

Hæmothorax with the possibility of active bleeding was usually present. A major thoracotomy was performed with removal of the foreign body, suture of the bleeding lung, drying of the pleural cavity, and closure. As the wounds could not be left open, the outcome was determined largely by the presence or absence of infection.

5. Penetrating or perforating wounds made by machine-gun or rifle bullets or small bits of shell casing. In these cases there was usually a small wound of entrance and hæmothorax developed. The best results were obtained by expectant treatment with late operation if necessary.

Of the 190 patients twenty-five died in the shock ward before they became operable. Forty belonged to Groups 2 and 3. There were sixteen deaths, a mortality of 40 per cent. In forty-three cases a major thoracotomy and some operation on the lung were performed. In this group there were twenty-seven deaths, a mortality of 63 per cent. Eighty-two cases belonged to Group 5; seven patients died, a mortality of 8.5 per cent. The total mortality in cases in which the thorax was opened at the time of injury was 39.5 per cent.

The time since injury varied considerably but averaged about sixteen hours. Therefore the wounds were heavily infected, 40 per cent showing streptococci and nearly all showing anaerobes in cultures. In cases of hæmothorax with bleeding, saline infusion and transfusion were contra-indicated. In the fatal cases pneumonia of the opposite lung occurred frequently when either local or general anæsthetics were used and in some cases in which death occurred before operation was attempted. Patients with a blood

pressure below 90 were sent to the shock ward for treatment. Only sucking wounds or those with active hæmorrhage were operated upon in the presence of low blood pressure.

Ether can be used with entire satisfaction as an anæsthetic. Pressure for distention of the lung can be obtained from a gas tank or more simply by means of a dentist's foot pump. The lung can thus be distended or collapsed at will to facilitate examination of the wound.

There were two methods of approach, rib resection and incision into the thorax between the ribs. The latter requires a rib retractor but is much easier to close as strong catgut will bring the ribs together and obviate the necessity of suturing the pleura which is often impossible.

ROSCOE C. WEBB, M.D.

Donati, M.: Decortication and Pneumopexy in the Operative Treatment of Fistulous Chronic Empyema (Decorticazione e pneumopessia nella cura operatoria dell'empima cronico fistolizzato). *Arch. ital. di chir.*, 1921, iii, 517.

Donati reviews the history of pulmonary decortication in cases of chronic empyema since it was first done by Fowler in the United States and by Delorme in France.

The success of pulmonary decortication depends upon the possibility of maintaining the expansion of the lung obtained by the operation; if any degree of hydrothorax or pneumothorax persists, or if infection recurs, the efforts of the surgeon will have been in vain. For these reasons many surgeons have believed that decortication should be done with a thoracotomy of the Schede type.

To obtain a complete and sure result from pulmonary decortication Donati believes it is necessary to disinfect the focus thoroughly beforehand and to assure the prompt adhesion of the re-expanded lung to the thoracic wall.

The more recent methods of disinfecting wounds are more efficient than those formerly used. The adhesion of the lung to the thoracic wall can be obtained only by parietal pneumopexy following the decortication.

Donati discusses total or partial pleurectomy as described by several authors in connection with decortication of the lung. He points out that anatomically the pleural covering adheres closely to the lung and that a pleurectomy is not practical. When a pleurectomy of the type referred to is done the pleura is not separated from the underlying lung, but the lung, covered with its investing pleural sheath is separated from the pseudomembranous inflammatory fibrous covering which is adherent to it. When this separation has been effected and the lung is free, pneumopexy is to be considered. Donati discusses the attempts at pneumopexy made by Lambotte, Goldmann, Souligoux, Perthes, and Pieri. He then describes his own method of costo-diaphragmatico-pulmonary decortication followed by pneumopexy.

The thoracic incision runs intercostally and either immediately above or immediately below the fistu-

lous orifice. It begins posteriorly at the costo-vertebral angle and runs anteriorly to the limit of the pleural sac where it is continued by another ascending incision running obliquely the distance of three or four ribs and intercostal spaces. The soft parts having been dissected and turned over, the costotomy, section of muscles, and ligation and section of the vessels are done. The thoracotomy may be of any type, but before the thoracic flap can be lifted it may be necessary to separate the thickened underlying pleura from the thoracic wall by means of the finger. A parietal, pulmonary, and diaphragmatic decortication follows. This also can usually be done with the finger but may occasionally necessitate the use of the bistoury.

When the lung is completely freed, any lesions on its surface are repaired with fine catgut. Then, with a Reverdin needle, such a number of strong catgut U-sutures as may be thought necessary are passed through the intercostal spaces into the pulmonary tissue, preference being given to remaining fibrous tissue. Sutures are passed also from the base of the lung and diaphragm and are knotted. When the costal flap is replaced and sutured in position the U-sutures of the pneumopexy are tightened and sutured over it.

Donati reports a case in which this technique was used. There was some slight postoperative trouble due to the persistence of slight sepsis. On this account he insists upon rigid pre-operative disinfection. Such complications are insignificant when compared with those resulting from so-called thoracoplastics. Donati's patient ultimately recovered. The technique is clearly illustrated.

W. A. BRENNAN.

Sistrunk, W. E.: Cancer of the Breast, with a Study of the Results Obtained in 218 Cases. *Pennsylvania M. J.*, 1921, xxiv, 781.

The author reports a detailed study of 218 traced cases of cancer of the breast operated on in the Mayo Clinic during the years 1911, 1912, and 1913.

Recurrences were found largely in the late cases, and evidently occurred because cancerous tissue was left in regions inaccessible to the knife. The highest percentage of cures and the lowest percentage of recurrences occurred in patients operated on early in the course of the disease before glandular involvement could be demonstrated.

The author believes that if it were possible to operate on all patients in the early stage of the disease and before the glands are involved, 75 or 80 per cent of those with cancer of the breast would obtain five-year to eight-year cures.

The lymphatic drainage of the breast is briefly reviewed and emphasis placed on the impracticability of removing the supraclavicular glands. It is impossible to remove the lymphatics which accompany perforating branches of the internal mammary and intercostal arteries.

Local recurrence developed in 10.5 per cent of the patients in whom no glandular involvement could be

demonstrated at the time of operation. Of forty-six cases with local recurrences the glands were involved at the time of operation in 80.4 per cent.

The operative procedure consisted of: (1) wide removal of skin and subcutaneous fat, (2) wide removal of both pectoral muscles, (3) extensive dissection of the subscapular and axillary lymphatics, (4) removal of glands and fascia from the infraclavicular triangle, (5) removal of a portion of the fascia covering the upper portion of the rectus muscle, and (6) a modified Rodman incision. The functional result in the arm was perfectly satisfactory and the scar caused no pain.

The axillary glands were found involved in 60.5 per cent of the patients comprising the series. Of eighty-six patients operated on before glandular enlargement developed, 64 per cent were alive from five to eight years after the operation and recurrences are known to have developed in six. In 132 patients with glandular enlargement at operation 19 per cent are alive from five to eight years after the operation, and three of these are known to have recurrences at the present time. Of the 218 patients, 36.7 per cent are alive from five to eight years after the operation and nine are known to have recurrences. The involvement or non-involvement of the glands seems to be the chief factor in the prognosis following operation. Patients with glandular involvement at the time of operation cannot be expected to live more than eight years.

About half of the patients were under 50 years of age and half were over 50. Ten per cent more of those over 50 were alive five to eight years after the operation than of those under 50. One hundred and fifty-seven had borne children and fifty-five had not. In two patients carcinoma was present during pregnancy and both died. Four patients had carcinoma in lactating breasts and in these cases also the mortality was 100 per cent. An ulcerating growth was found in twenty patients; 85 per cent of these are dead. The growth was located in the upper and outer halves of the breast twice as often as in the lower and inner halves. Evidences of metastasis in other regions were found in 60.9 per cent of the patients in whom local recurrences developed.

One patient died in the hospital, giving an immediate mortality of 0.4 per cent.

One hundred and four of the 138 patients known to be dead died of recurrence of the cancer, twenty-three died from unknown causes, and eleven died from causes other than cancer.

Of the 218 patients studied, 2.7 per cent died in six months, 21.1 per cent in one year, 34.9 per cent in two years, 49.1 per cent in four years, 55 per cent in five years, and only 2.3 per cent after five years. In the cases of 5.9 per cent of the patients the time of death was not determined.

Three-year cures were obtained in 36.3 per cent of 132 patients with glandular involvement at the time of operation and in 75.6 per cent of those without glandular involvement at the time of operation. Without regard to glandular involvement, 51.8 per cent were alive at the end of three years.

Five-year cures were obtained in 22 per cent of the 132 patients with glandular involvement at the time of operation and in 65.1 per cent of the eighty-six without glandular involvement at the time of operation.

In five cases a specimen was removed for pathologic diagnosis from two days to two months before the radical operation. Seventy-five per cent of these patients were alive without recurrence five to eight years after the operation. The removal of specimens apparently does not necessarily make the prognosis unfavorable.

J. A. BUCHANAN, M.D.

Aperle, G.: Tansini's Method of Amputating the Breast in Cases of Cancer (Sobre el procedimiento de Tansini para la amputación de la mama en caso de cáncer). *Siglo med.*, 1921, lxvii, 789.

Tansini was of the opinion that radical procedures for amputation of the breast in cases of cancer did not take sufficient account of cutaneous recurrences. In his opinion special attention should be given to complete extirpation of all the skin of the breast. The Tansini method includes extirpation of the breast *in toto* with flap dissection including the major and minor pectorals and all the lymphatic connections of the breast as far as the axilla. The large aperture is then filled with a musculocutaneous flap cut from the back with its pedicle in the axilla. In this way the plastic reconstruction is done with fresh resisting skin taken far from the mammary region and cicatricial retraction is prevented. According to the author this method has these special advantages:

1. The possibility of completely eradicating the cancer.

2. Prompt operative recovery by first intention even in cases of extensive involvement.

3. Absence of cicatricial retraction, of adhesions to the vein, and of consequent obstruction to circulation and limitation of movement of the arm. Such conditions are brought about by the adhering scars and other defects of healing which are generally observed in cases operated upon by other techniques.

In Aperle's opinion the method of Tansini is so perfect technically and therapeutically that it is without doubt the method of choice in cases of mammary cancer.

W. A. BRENNAN.

PHARYNX AND ŒSOPHAGUS

Guisez, J.: The Pathogenesis and Treatment of Severe Dilatations of the Œsophagus (Pathogénie et traitement des grandes dilatations de l'œsophage). *Presse méd.*, Par., 1921, xxix, 661.

Guisez refers to the severe œsophageal dilatations, incorrectly termed "idiopathic," which occur in the lower two-thirds of the subdiaphragmatic portion of the œsophagus.

According to the author's statistics these dilatations constitute one-sixth of all the diseases of the œsophagus. During 1920 he diagnosed 35 cases, the majority those of males at or beyond middle age.

With regard to the pathogenesis there are two main theories, that of primary cardiospasm and that of insufficiency of peristalsis or primary atony of the œsophagus. The theory of primary cardiospasm is the theory most generally accepted as being in agreement with the clinical and therapeutic findings. Guisez is of the opinion that the theory of primary atony is true only in certain pathologic conditions in which the œsophagus is paralyzed. Such cases are quite exceptional; Guisez has seen only three. The repetition of the functional spasm leads to inflammatory stenosis and occasionally cicatricial degeneration. Guisez believes that atony is secondary and late in the evolution of the condition. The stasis of food brings about a deep œsophagitis which favors cancer. Guisez has found cancer in 26 such cases.

With regard to the treatment, the author states that if œsophagoscopy and X-ray examination show that the condition is not far advanced, medical and dietetic treatment suffice. In simple spasmodic stenosis progressive dilatation should be done. For several years the author has treated such cases by multiple dilatation, that is, he passes two small guide sounds first and then a larger one over them. These may be permitted to remain in place as long as fifteen minutes. In inflammatory stenosis it may be necessary to pass a fine bougie under endoscopic guidance. A very marked degree of horizontal dilatation is possible.

In certain severe cases a gastrotomy may be necessary. Such an operation was indicated in 15 of Guisez's cases.

The author believes that the more complex surgical operations, i.e., cardia dilation by the gastric route, œsophagogastric anastomosis, partial resection of the dilated œsophageal sac, etc. are scarcely warranted. Under endoscopic guidance the most severe types of this lesion can be treated successfully through the natural routes. If the dilatation is maintained sufficiently long and is repeated regularly, the dilated pocket, if not too large, will return to its original dimensions and deglutition will become normal. By the method described Guisez has never failed to cure even the most advanced type of case.

W. A. BRENNAN.

Lundblad, O.: An Antethoracic Œsophago-Plastic Operation (Ueber antethorakale Œsophagoplastik). *Acta chirurg. Scand.*, 1921, liii, 535.

The author discusses first the Roux method of treating burns of the œsophagus. In this procedure Roux introduces a medium-sized stomach tube into the nose, forces it down to the stomach, and leaves it in position until healing has taken place. Roux and others have reported excellent results. The author, however, is not so favorably impressed with this method as it did not prove successful in a case in which he tried it. Furthermore he states that in many severe burns of the œsophagus it is impossible to pass a sound or tube. For these and other severe cases in which the passing of tubes, electrical treat-

ment, œsophageal incisions, and other comparatively conservative methods are of no avail, Lundblad sees in his antethoracic œsophago-plastic operation a method of overcoming the difficulty. A case reported in this article was as follows:

The patient was a 3-year-old boy who had swallowed lye. Sounding or the passing of tubes was impossible, and as the patient could not swallow any nourishment, a gastrotomy was done according to the Witzel method. The artificial fistula thus formed was sufficient to furnish him nourishment as long as necessary, and was closed about two years later. About a year after the gastrotomy the child's parents consented to such further surgical procedures as the author considered necessary. It had been Lundblad's intention to construct the œsophagus under the breast skin from a loop of small intestine but the mesentery of the small intestine was too short. Accordingly, the entire transverse colon (about 22 cm. in length) was divided at the flexures with care that the circulation should be adequate for the resected portion as well as for the rest of it, and the end of the ascending colon was united to the end of the descending colon.

The resected portion of colon was left connected with its portion of mesentery but the mesentery was divided between the resected and the remaining portions. The splenic end of the resected portion of colon was implanted into the stomach just below the lesser curvature as near the cardia as the fistula permitted. The other end was then drawn up under the skin to about the level of the second rib in the mammary line, where a transverse opening was made through the skin. The colonic mucous membrane was then sutured to the skin incision, a temporary opening being thus formed. The peritoneum was sutured about the intestine and the abdominal incision closed.

The implanted colon soon healed, the patient recovered from the operation very rapidly, and after a few days took nourishment through the newly created intestinal œsophagus. Peristalsis could then be observed; the author had been careful to place the implanted colon so that this would occur in the right direction.

After a time it became evident that there was some obstruction between the intestinal œsophagus and the stomach. At operation it was found that the opening into the stomach from the implanted colon had practically closed. Without any great difficulty, however, it was opened and enlarged and the patient soon recovered.

The next step in the procedure consisted in uniting the neck part of the œsophagus with the created antethoracic portion. This was done by making an incision at the inner border of the sternocleidomastoid on the left side, drawing the œsophagus down, and uniting it with a double row of sutures with the upper end of the intestinal œsophagus. At first, on account of discharges and constant irritation, considerable difficulty was experienced in preventing the formation of a fistula at the site of union of the two ends. Final-

ly, however, good union was obtained so that six months later the patient was able to swallow both solid and liquid food by means of the newly constructed intestinal oesophagus. As the fistula made in the stomach was then no longer necessary, it was closed.

It is noted that the patient does not swallow as readily as with a normal oesophagus, but if the food accumulates there is no difficulty in pushing it down from the outside. When he cries or presses, the stomach contents tend to come up into the intestinal oesophagus, but they never rise as far as the throat. The child's appetite is good, he is well nourished and is growing, his stools are normal, and in general his condition is excellent.

Bircher appears to have been the first (1894) to construct an organic substitute for the thoracic part of the oesophagus. Like von Hacker, he attempted to form an oesophageal tract by turning in the external surface of the skin in such a manner as to form an oesophageal channel. Others attempted the same method but with unfavorable results. Wullstein proposed, and Roux carried out, the idea of constructing an oesophageal tract from the small intestine. However, on account of the shortness of the mesentery, it was seldom possible to obtain a loop long enough to reach up to the normal oesophagus in the neck. Consequently those who tried this method were usually forced to construct a tube of skin in the intervening space and their results were not favorable. Kelling used the transverse colon to form an oesophagus and made a skin tract to join the normal oesophagus above to the newly constructed intestinal oesophagus. He thus showed the possibility of using the large intestine for this purpose. Almost simultaneously other surgeons performed similar operations with favorable results.

Hirsch and Jianu adopted entirely different plans, forming a new oesophageal tract from portions or strips of the stomach wall. They succeeded in constructing an antethoracic oesophageal tract which extended up as far as the neck and joined this to the normal oesophagus in the neck by means of a skin tract.

In discussing his own operation the author emphasizes that it should be undertaken only in cases of complete stricture of a non-malignant nature or, if used in cases of malignant growths, only after the growth has been removed. He does not consider, as some authorities do, that children are unfavorable subjects for such a procedure. He adds that a gastrotomy or enterostomy must precede the operation in order that the patient may be supplied with nourishment until the newly created tract can function. He does not approve of the use of skin to form an oesophageal tract even if the distance to be bridged is small. The digestive juices almost always interfere with, or prevent, healing, and when skin is used a continual irritation is present. Moreover, cases have been reported in which hair growing from the epidermis formed an obstruction in the tract. The author is of the opinion also that skin will not stand the constant irritation of the digestive juices for a long

time, and that cancer would be apt to develop as the result of such irritation.

The tract should be made as nearly normal as possible and this can be done best by forming the entire new oesophageal tract from the stomach to the oesophagus in the neck from intestine. As usually small intestine cannot be obtained in sufficiently long portions, Lundblad prefers the transverse colon. The use of the small intestine has the disadvantage that the blood supply is not so good; portions of small intestine transplanted to form an oesophageal tract have often become gangrenous. The use of the stomach to build a new oesophagus is objected to because the stomach is often atrophied and therefore unsuited for the purpose, while under the most favorable circumstances it is almost impossible to form a tract sufficiently long.

In conclusion the author admits that operations to form a new oesophagus are still imperfect but states that on the basis of his own cases and those of other surgeons he has every reason to expect excellent results in the future. One of Blauel's patients who had a new oesophageal tract constructed from small intestine and skin served a half year in a strenuous military campaign, eating the same food as other soldiers and living the same life. In von Hacker's case in which the transverse colon and a skin tract were used, the patient's general health is excellent after a period of four and one-half years, although ulcer formation was predicted. These results show that it is possible in these unfortunate cases to restore conditions so nearly to the normal that the patient is able to enjoy his food and follow his usual calling.

W. H. MEENTS, M.D.

MISCELLANEOUS

Jacobaeus, H. C., and Key, E.: Some Experiences with Intrathoracic Tumors, Their Diagnosis and Their Open Treatment. *Acta chirurg. Scand.*, 1921, liii, 573.

The authors describe five cases of intrathoracic tumors and one case of solitary tubercle of the lung which simulated a tumor. In two cases the tumor was restricted to the lung. In one of these no operation was performed. In the other it was found by thoracotomy test that the growth was not removable. Three times an extrapulmonary tumor growing in the pleural cavity was extirpated successfully. On account of the diagnosis of tumor lung resection was done in the case of solitary tubercle.

The diagnosis was based chiefly on X-ray examinations before and after artificial pneumothorax and a thoracoscopic examination after pneumothorax. The latter procedure showed the position of the tumors in the pleural cavity especially regarding their connection with the lung, and their size, shape, and appearance, all of which are of the greatest importance in determining the possibilities for operation.

The conclusions drawn are as follows:

1. For the diagnosis and localization of pleural and lung tumors it is of great importance to make an

X-ray examination before as well as after the induction of pneumothorax. An X-ray examination made after the induction of pneumothorax gives valuable information supplementing that already obtained in the X-ray examination made before the induction of pneumothorax.

2. By thoracoscopic examination valuable information is obtained for the diagnosis and localization of pleural and lung tumors which supplements the results of the X-ray examinations.

3. If there is no opportunity to use a differential-pressure apparatus, it might be advantageous to

induce pneumothorax previous to the operation in the pleural cavity.

4. If differential-pressure apparatus is employed, pneumothorax for the thoracoscopic examination should be induced as shortly before the operation as possible in order that the inflation of the lung after the operation may not be rendered more difficult or impossible.

5. If the lung is inflated after the completion of the operation, more favorable conditions for healing are eventually obtained.

FREDERICK CHRISTOPHER, M.D.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Krivsky, L. A.: On the Pseudomyxoma Peritonei.
J. Obst. & Gynec. Brit. Emp., 1921, xxviii, 204.

This disease is due to the flooding of the abdominal cavity with masses of gelatinous matter due to the rupture of a pseudo-mucinous ovarian cystoma or the bursting of the appendix when it is too greatly expanded by its mucous contents. There are typical adenocystomata of the ovary which are peculiar in that their walls are very thin and therefore burst easily. The contents of the various loculi in these tumors are not identical, the secretion in the larger and older cavities being of a watery nature while that in the smaller and younger cavities is gelatinous.

Following the flooding of the abdominal cavity the so-called "implantation" may develop. This is characterized by the appearance on the peritoneum of secondary cystomata due to the grafting upon it of some of the living elements of the primary cystoma. These secondary cystomata produce in their turn pseudo-mucinous masses or cysts. In some cases the peritoneum shows only chronic inflammation, while in others both inflammation and implantation are found. This is probably explained by the age of the cystoma. If of considerable age and if its contents are without living epithelial elements, only the reactive inflammation appears in the peritoneum; if it is of recent formation and if elements capable of further growth escape into the peritoneal cavity, the process of inflammation is complicated by implantation.

The only correct treatment of this disease is excision of the ruptured cystoma and the removal of the colloid matter which has escaped into the peritoneum. If the removal is not complete the condition will continue to spread.

It has been proved that the disease occurs in men even more frequently than in women. Recently authors have come to the conclusion that in many cases the disease has originated in both the ovary and the appendix. It is not known, however, which organ was first attacked.

A case is presented in which there were two distinct causes of the condition: (1) the bursting of the wall of a cystoma of the left ovary, and (2) a

cyst-like formation which represented the appendix and had been filled with mucus which had escaped into the peritoneal cavity through three perforations.

With regard to the malignancy of the condition there is much doubt, there being a great difference between cases. Some cases are definitely malignant and in others there has been no recurrence of the disease during a period of more than seventeen years.

I. W. BACH, M.D.

Hesse, E.: Subdiaphragmatic Suppurative Peritonitis Originating in the Bile Ducts (Zur Frage der Subdiaphragmalen von den Gallenwegen ausgehenden eitrigen Peritonitis). *Verhandl. d. Wiss. Ver. d. Ärzte d. St. Trinitatis-Krankenh.*, Petrograd, 1920.

The twenty-four-year-old patient was attacked suddenly, twenty-four hours previously, with severe pains in the chest and back and less severe pains in the right upper abdomen. No vomiting occurred. The right upper abdomen was somewhat tender. The chief point of pain was on the right side, posteriorly, in the eighth intercostal space. Diminished resonance was noted from the seventh intercostal space downward in the scapular line. Exploratory puncture in the eighth intercostal space on the right side between the scapular and axillary lines yielded a thin, odorless, green pus (streptococci). The temperature was 38.5 degrees C. There was no sign of perforation peritonitis. A diagnosis of subdiaphragmatic abscess originating in the gall-bladder was made.

Operation was begun under local anæsthesia and completed under chloroform anæsthesia. Following resection of the eighth rib the pleura was found to be free. The pleural cavity was closed off by suturing the diaphragmatic pleura and the costal pleura. Incision of the diaphragm revealed below it a moderate amount of pus. On removal of the pus, the lower margin of the liver and the colon ascendens unexpectedly came into view (meteorism). The subdiaphragmatic space communicated with the free abdominal cavity. Kehr's section was done. In the abdominal cavity a purulent exudate was found. The intestines were coated with fibrin. Perforating suppurative fibrous and calcareous cholecystitis was

found. Six gall-stones lay free in the abdominal cavity between the intestinal loops. A cholecystectomy was done and the abdominal cavity drained posteriorly through the diaphragm. The laparotomy wound was closed by partial suture. A tampon was applied to the stump of the gall-bladder.

The postoperative course was complicated by pneumonia (the patient was chilled in the operating room which, because of present conditions, was unheated). In the course of the operation the pus escaped almost exclusively in the posterior direction. The pleura remained free. Healing occurred in two and a half months. A year and a half later an operation was performed for ventral hernia.

The author emphasizes the slightness of the abdominal symptoms caused by the perforation peritonitis and the localization of the pus in the subdiaphragmatic space, which is unusual in free peritonitis. In such cases transpleural drainage of the subdiaphragmatic space in a posterior direction is an excellent operative procedure. Attention has been called previously to this "drainage through the patient" by Riedel.

HESSE (Z).

GASTRO-INTESTINAL TRACT

Goto, S.: The So-Called Digestive Ulcer of the Gastro-Intestinal Tract. *Japan Med. World*, 1921, xxxi.

This paper is based on experimental studies on animals with special reference to the etiology and pathology of ulcer in the various parts of the gastrointestinal tract.

On the basis of the first series of experiments in which gastro-enterostomy was performed and the duodenal juices were diverted into the stomach, the author concludes that the factor in the resultant ulcers at, or just below, the line of anastomosis were caused by trauma and interference with the blood and nerve supply rather than by the digestive action of the gastric juice.

In the second series of experiments in which gastro-enterostomy was done and the duodenum left suspended in a loop or displaced, ulcer was found at the bottom of the loop or at the point of anastomosis.

In a third series it was found that duodenal ulcers and mucous hemorrhages can be produced by section of the hepatoduodenal ligament and fixation of the duodenum following its posterior rotation.

Gastric ulcers were produced in rabbits and guinea pigs by cutting the left gastric artery and the sympathetic nerve which runs along the artery.

Vagus-nerve section just below the diaphragm favored the formation of ulcer when done alone, but when done in conjunction with section of the arterial and sympathetic nerve supply produced deep ulceration and perforation.

The author concludes from all these experiments that the important factors in the production of ulcer are disturbances of circulation and innervation which are frequently the result of inflammatory conditions in the abdomen. The inflammatory signs found

around an ulcer at operation may be the cause of the ulcer rather than the result of it.

I. E. BISHKOW, M.D.

Muller, G. P., and Ravdin, I. S.: Perforated Gastric and Duodenal Ulcer Without Previous Pain. *Ann. Surg.*, 1921, lxxiv, 223.

In four of fourteen cases of perforated gastric and duodenal ulcer the perforation was the first sign of abdominal pathology.

The explanation of the presence or absence of pain in ulcer depends on a knowledge of the anatomico-physiological reflex of gastric and duodenal pain.

A detailed description is given of the nerve supply of the stomach and intestine, and the work of various investigators is quoted to show that there are two systems of nerve supply to the stomach which are physiologically antagonistic. Further, that when any part of the alimentary tract is stimulated to contract, the part below relaxes.

Various theories as to the production of pain in ulcer are considered and discarded. It is the belief of the authors that the cause of gastric pain is intragastric tension. Increased intragastric tension can exist only when there is food in the stomach and the peristaltic wave as it approaches the pyloric end meets contraction of the pylorus instead of relaxation due to the acid chyme which reaches the duodenum. With an increase in the intragastric pressure the peristaltic waves increase, more acid chyme is sent into the duodenum, and the pyloric relaxation is inhibited for still longer periods.

In explaining cases not associated with pain, it has been pointed out by investigators that there are cases without hyperacidity and therefore intragastric tension is not increased.

The authors report four cases of perforated gastric ulcer in which recovery followed operation.

I. E. BISHKOW, M.D.

Sencert and Allenbach: The Surgical Treatment of Perforations of the Stomach by Ulcer and the Functioning of Gastro-Enterostomy in Case of Permeability of the Pylorus (Sur le traitement chirurgical des perforations de l'estomac par ulcère et sur le fonctionnement de la gastro-entérostomie en cas de perméabilité du pylore). *Bull. et mém. Soc. de chir. de Par.*, 1921, xlvii, 1055.

In cases of gastric perforation due to ulcer it has been Sencert's practice during the past two years to suture the perforation and perform an immediate posterior gastro-enterostomy. In eight such cases there were seven recoveries and one death, the latter due to bronchopneumonia. There is nothing new in the procedure or in the results, but the facts noted on repeated examination of these patients throw further light on the value of the method.

These cases were operated upon from eight to twelve hours after the perforation. The time of operation generally did not exceed thirty to thirty-five minutes. The alleged disadvantages of per-

forming a gastro-enterostomy in addition to the suturing, i.e., prolongation of the time of operation, diffusion of peritoneal infection, and difficulty due to the septic condition of the area, were not observed in these cases.

In five cases the ulcer was situated on the lesser curvature. The ulcer nearest the pylorus was at a distance of 3 cm. After suture, no particular stricture of the pyloric canal was noted. In the study of these five cases under the fluoroscopic screen during the two years since the operation it has been found that nearly all of the bismuth meal passes from the stomach through the gastro-enterostomy opening. This shows that, despite the absence of organic stricture, the gastro-enterostomy has functioned well. Sencert believes that the gastro-enterostomy serving alone for the evacuation of the stomach has favored cicatrization of the perforation by preventing all retention in the posterior part of the stomach.

The opinion that a gastro-enterostomy fulfills its evacuating function only when the natural outlets, the pylorus and duodenum, are impermeable has been held by many surgeons and roentgenologists. To demonstrate that this theory is erroneous Sencert carried out a number of experiments on dogs. These showed that after resection of the lesser curvature a gastro-enterostomy assures complete evacuation of the stomach in spite of complete anatomical integrity of the pylorus and that while even a low gastro-enterostomy is not used for evacuation in a normal stomach it is used alone for the evacuation of a stomach without lesions but deprived of its motor innervation. A gastro-jejunal anastomosis made on a normal stomach does not function, the motor co-ordination continuing to direct the gastric contents toward the pylorus. If this co-ordination is altered, however, the neostomy will be used.

After a saddle resection of the stomach and suture and invagination of a perforation in clinical cases, evacuation by the perfectly intact pylorus is incomplete and slow, but if a gastro-enterostomy is added, the gastric evacuation will be effected by this means. This is due to the section, destruction, or alteration of the motor innervation of the stomach in the lesser curvature.

W. A. BRENNAN.

Basset, A., and Uhlrich, P.: Gastro-Enterostomy in the Urgent Treatment of Perforated Ulcer of the Stomach and Duodenum (De la gastro-entérostomie dans le traitement d'urgence de l'ulcère perforé de l'estomac et du duodénum). *Arch. de mal. de l'appar. digest.*, 1921, xi, 225.

Basset and Uhlrich believe that supplementary gastro-enterostomy has not been practiced systematically in the urgent treatment of perforated ulcer of the stomach and duodenum and that the best course to follow in the great majority of cases is suture of the perforation with or without thermocauterization and as complete invagination as possible. In order to prevent stricture in cases of

pyloro-duodenal perforations the suturing should be perpendicular to the axis of the stomach.

Following the operation the patient should be kept under close supervision for several months and during this time should be subjected to frequent clinical and X-ray examinations. In case of retention, difficulty of gastric evacuation, secondary stenosis, recurrence or persistence of the ulcer, a secondary operation, either a gastro-enterostomy with or without pyloric exclusion or a resection is indicated. These secondary interventions should be performed under non-febrile conditions except when immediate operation is indicated by the patient's general condition or functional disturbances and the patient has recovered from the acute effects of the perforation.

The only indication for an immediate supplementary gastro-enterostomy is a very manifest stricture of the pyloro-duodenal segment and in such cases it should be performed only if the patient's general condition permits and there is no risk of diffusing the infection throughout the abdominal cavity. In the authors' opinion uniparietal operative stricture of the duodenum after the suturing of a perforation does not necessitate an immediate supplementary gastro-enterostomy and this operation is never indicated after the suture of a perforation of the stomach distant from the pylorus. Their opinion is based on a study of recent literature and their own clinical experience.

W. A. BRENNAN.

Zoeppfel, H.: Operative Methods for Gastric and Duodenal Ulcers As Regards Acidity (Operationenmethoden bei dem Magen- und Zwölffingerdarmgeschwür unter dem Gesichtspunkt der Salzsäureverhältnisse). *Deutsche Ztschr. f. Chir.*, 1921, clxiv, 342.

In determining whether preference should be given to gastrectomy or gastro-enterostomy in the treatment of gastric and duodenal ulcers, it is of importance to consider by which means the formation of peptic ulcers can be prevented. It is generally believed that ulcers develop under the digestive action of the gastric juice and especially under the influence of the gastric acid. The object of operation must then be to decrease the amount of hydrochloric acid in the gastric juice, to produce an artificial achylia.

Stierlin, Kelling, and also von Haberer have proceeded with this end in view. That resection of the pylorus, the method proposed and first performed by von Haberer, brings about an artificial achylia was demonstrated by the author in twenty-eight cases. The achylia is apparently not incompatible with the functions of the digestive tract which soon becomes adapted to the new conditions. While the author does not recommend resection as the method of choice in every case, he considers resection of the primary ulcer according to the Billroth II method (as modified by Kroenlein and von Mikulicz), with occasionally removal of the pylorus, as the method which has given the best guarantee of permanent recovery.

HEINEMANN-GRUEDER (Z).

Gross, H.: Operation for Gastric Ulcer: A Report of 199 Cases (Die Operation des Magenkoerperulcus: Ein Bericht ueber 199 Faelle). *Ztschr. f. Chir.*, 1921, clxiii, 289.

In addition to the relief of the local suffering the surgical treatment of gastric ulcer must effect such a transformation that the cause of the ulcer formation is removed as much as possible. The author seeks to accomplish this by mobilizing the immovable, stiff, and firmly fixed gastric route by means of prepyloric section. Gastro-enterostomy creates a new gastric route to a certain extent but not in the longitudinal fold along the lesser curvature. This requirement, Gross states, is best met by his more extensive excision operation. He believes that resection in continuity is not the best method for ulcer of the body of the stomach for the following reasons:

1. The high mortality. Of eight patients subjected to this operation, three died, one from acute pancreatitis and the two others from foetid bronchitis with pneumonic foci and lung gangrene. These lung complications were caused by impairment of gastric function due to the operation and the displacement of infective material.

2. The fact that in the five cases ending in recovery it was possible to unite the two stomach ends in only two. In the three others it was necessary to perform a Billroth II operation and therefore a considerable portion of the stomach remained deep down in the abdomen and thus of no use to the body metabolism.

Excision of the ulcer is often criticized unfavorably because the usual site of the ulcer is on the lesser curvature, near the posterior wall. The loss of substance caused by the excision and by the closure of the defect leads to decided changes in the form of the organ. The avoidance of these results is accomplished by: (1) gastro-enterostomy; (2) section of the distal end of the stomach just proximal to the pylorus; (3) a longitudinal incision along the lesser curvature as far as the ulcer.

In cases of small and medium sized ulcers of the lesser curvature, in which the general size and shape of the stomach are not altered, good results are practically always obtained by simple excision in conjunction with gastro-enterostomy. When there is considerable shrinkage of the stomach and shortening of its lesser curvature, when excision of the ulcer would be particularly difficult, or when the ulcer penetrates into the pancreas or liver, it is advisable to divide the pylorus before doing the excision. This separation relieves the lesser curvature; its surface, which has been irritated, contracted, and adherent to surrounding structures, is freed. The greater the decrease in length of the mobilized stomach, the greater the increase in its transverse diameter. By preliminary separation of the pylorus, the excision of the ulcer and the suturing of the resulting defect are greatly simplified.

As the pyloric end of the stomach is clamped off and drawn forward and toward the left side, an excellent opportunity is afforded to inspect the posterior wall of the stomach; an ulcer that may be found in this

location can be removed by an oval excision. In order to obtain a better view of the interior of the stomach and also a better means of covering large defects of the posterior wall of the lesser curvature, an incision is made from the pyloric opening along the lesser curvature as far as the ulcer. Following destruction of a large portion or the greater part of the posterior wall of the stomach, the anterior wall is made to serve as a substitute, being drawn posteriorly. The complete interruption of the blood supply on the side of the lesser curvature does not cause any marked disturbance.

COLLEY (Z).

De Martel, T.: Gastrectomy: A New Operative Technique. *Am. J. Surg.*, 1921, xxxv, 227.

Gastrectomy is the only treatment which can be used in carcinoma of the stomach, and in many cases is the best treatment for ulcer of the stomach.

Before operation the patient's mouth and teeth are cared for and daily gastric lavage is given except in cases of gastric hæmorrhage.

Either local or general anæsthesia may be employed. The author prefers a gas anæsthetic after a dose of scopolamine and morphine. The patient is placed with his head and the upper part of his body horizontal and the rest of his body inclined downward. A medium incision from the xiphoid cartilage to the umbilicus is made, a right-angle extension of the incision from the umbilicus to the external border of the right rectus being added if necessary.

The transverse colon and omentum are raised and the omentum is separated from the colon. This brings into view the second portion of the duodenum, the head of the pancreas, the pylorus, and the posterior surface of the stomach. The blood vessels of the greater and lesser curvatures are tied with linen and divided. De Martel then uses a crushing instrument which consists of three sets of blades. After this is applied to the stomach, the central portion is removed and the crushed tissue is cut across. An over-and-over suture is used on the ridge of crushed tissue, and after removal of the proximal crusher an invaginating suture beginning at the center and working out to the ends is inserted. The distal portion of the stomach is raised with one section of crusher on the cut end and after ligation of the vessels about the duodenum. The duodenum is sectioned in one of several ways. By one method it

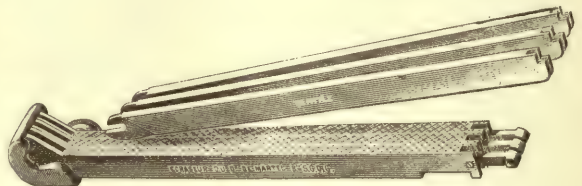


Fig. 1. The crusher demounted. The lower jaw formed by the juxtaposition of the three lower segments is held together by a shoe. The upper jaw also consists of three segments.

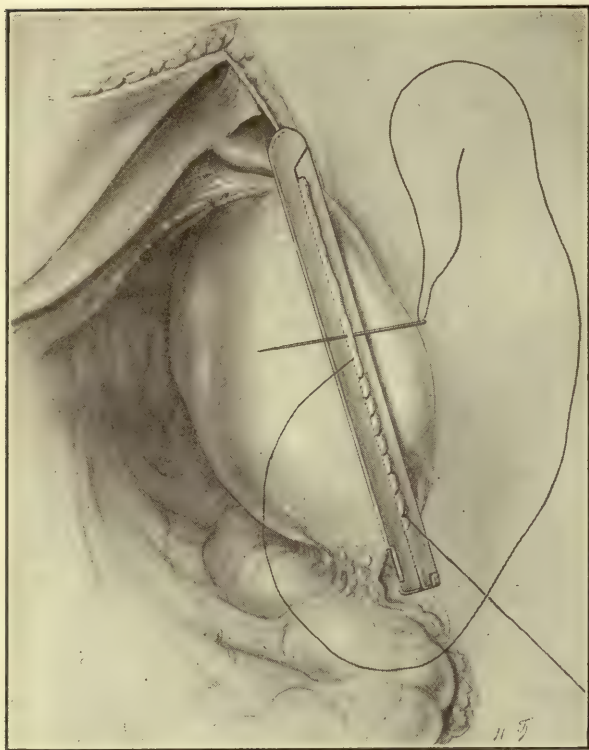


Fig. 2. Beyond the proximal segment of the crusher projects a flap of crushed stomach through which is passed an overcasting stitch on the free surface of the clamp.

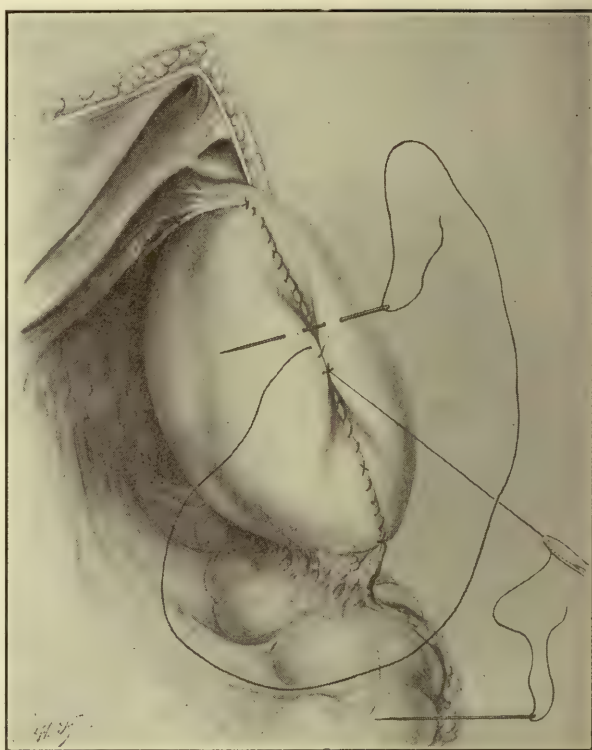


Fig. 3. Invagination of the crushed and sutured margin. The invaginating suture is begun at the center to facilitate the infolding of the angles. (De Martel.)

is cut after the application of a Mayo crusher. The crushed margin is then sewed with an overcasting suture and on removal of the crusher the margins are invaginated by traction on both ends of the suture. Another method consists in tying a horsehair suture in a groove and invaginating with a pursestring suture. A third method is the same as the second except that no crushing instrument is used. A gastro-enterostomy is then done in the usual manner.

I. E. BISHKOW, M.D.

Carlucci, G. A.: Polypoid Lipoma of the Intestinal Tract. *Ann. Surg.*, 1921, lxxiv, 230.

The salient points in the report of this case were as follows:

For a month prior to his admission to the hospital the patient complained of pain in the region of the umbilicus, the attacks coming on several times a day and persisting for four or five seconds. There was no blood in the stool, no belching, and no loss of weight.

At examination an oblong mass was felt on the left side of the abdomen. Apparently it involved the sigmoid, the splenic flexure, and the descending colon. The abdomen was distended. The X-ray examination was negative.

At operation it was found that the tumor mass was within the bowel, was attached by a pedicle to all the layers of the ileum, and lay in the cæcum. A resection of the terminal portion of the ileum and cæcum was done and followed by an end-to-side anastomosis.

The pathological report on the tumor was lipoma. One other similar case is reviewed.

I. E. BISHKOW, M.D.

Vollhardt, W.: The Treatment of Postoperative Ileus by Enterostomy (Beitrag zur Behandlung des postoperativen Ileus mit Enterostomie). *Deutsche Ztschr. f. Chir.*, 1921, clxiv, 352.

The author discusses the pathology and etiology of ileus somewhat in detail. Its most common cause is peritonitis. It is favored by fresh adhesions and hastened by the intoxication caused by the stagnated contents of the paralyzed intestines. The chief cause of the ileus which follows aseptic operations is intestinal paralysis. In addition, mechanical and chemical injury to the abdominal serosa may be responsible factors. Ileus may be purely dynamic or associated with an adhesion ileus. At first, only that portion of the intestine is paralyzed which lies closest to the affected peritoneal region. In contrast to the rapidly devel-

oping adhesion-ileus or volvulus, postoperative ileus is slow and gradual.

Gastric lavage gives temporary benefit. Hot air, peristaltin, pituglandol, subcutaneous salt solution, and heart stimulants are used. If rapid improvement does not follow their administration the author advises an immediate enterostomy. Under local anæsthesia he makes the incision over the area of greatest intestinal inflation, draws up and sews the distended loop of intestine to the skin, and inserts a drain through an opening in the loop. A quantity of gas and fluid is evacuated. After two to three days the tube is clamped off and later is removed. The fistula usually closes rapidly. Only rarely is it necessary to close it with lead plate sutures.

Fifteen cases are reported. Recovery resulted in nine and death in six. The author is of the opinion that even in the fatal cases the enterostomy gave relief.

MAY (Z).

Rénon, L., and Blamoutier, P.: Ulcerations and Perforations of the Small Intestine in the Course of Rectal Cancer (Les ulcerations et les perforations de l'intestin grêle au cours du cancer du rectum). *Bull. Acad. de méd., Par.*, 1921, lxxxv, 715.

Ulcerations and perforations of the large intestine in the course of rectal cancer are well known, but the authors have been able to find only two cases in the literature.

In this article the case is reported of a man 40 years of age who entered the hospital with the symptoms of advanced intestinal occlusion and died shortly after operation. At autopsy a perforation the size of a fifty-cent piece was found in one of the loops of the small intestine and there were other spots in which perforation appeared imminent. The small intestine beyond the ileocaecal valve showed many ulcerations. It was in one of these that the perforation had occurred. The recto-sigmoidal region was occupied by a hard tumor the size of an egg shown by histologic examination to be a cylindrical-celled cancer which had caused linitis plastica.

In the author's opinion the cause of the ulcerations which preceded the intestinal perforation in this case was very prolonged stagnation of the intestinal chyme and marked pathogenic action of the bacterial flora of the intestine. Necrosis of the intestinal wall was probably preceded by venous stasis and sloughing of the poorly nourished endothelium. The intestinal distension and the stagnation of feces increased the virulence of the intestinal bacteria and disturbed the nutrition of the intestinal tunics, causing venous stasis and obstruction of the finer vascular ramifications by bacterial emboli. W. A. BRENNAN.

Sskoloff, S. E.: Enteroptosis and Arterioesenteric Duodenal Occlusion (Duenn darmptose und arterioesenterialer Duodenalverschluss). *Verhandl. d. 6 Konferenz d. Wiss. Med. Ges.*, Petrograd, 1921, v, 31.

As was shown by the reports of the congress on splanchnoptosis held in Petrograd, enteroptosis is

becoming more common in Russia because of the poor nutrition of the people. Even the small bowel has not remained free from this affection and as a consequence the number of cases of arterioesenteric occlusion of the duodenum, a condition hardly known in Russia formerly, has also increased. The condition occurs particularly in extremely emaciated persons. The general disappearance of fat involves also the retroperitoneal fat lying between the aorta and the superior mesenteric artery. The angle between the two vessels becomes more acute and the development of arterioesenteric occlusion of the duodenum is thereby favored. Gastric motility must also be taken into consideration. Only when the latter is reduced does arterioesenteric occlusion become possible. If the stomach is involved in the general visceroptosis the conditions are particularly favorable for occlusion. Arterioesenteric occlusion of the duodenum, if left alone, always leads to death because of the resulting absolute hunger and the shock and lowering of heart function produced by the pull on the mesentery.

The author recommends the Schnitzler position in the treatment of the condition. If this does not lead to improvement in acute cases, the small bowel is probably held in the true pelvis by adhesions. If in cases of high ileus the abdominal position does not lead to improvement of the symptoms one must also think of the possibility of an organic ileus (incarcerated duodenojejunal Treitz hernia). In such cases operation is, of course, indicated. In the pure cases of acute arterioesenteric occlusion of the duodenum operation is not indicated. In chronic cases duodenojejunalostomy has been recommended by American authors.

The author briefly reports a case observed in the St. Trinitatis Hospital in Petrograd. The patient was a woman 45 years old. The clinical diagnosis was ileus ventriculi, inanitio. A few days before the operation the patient collapsed, vomited enormous masses of biliary vomitus, and became almost pulseless. The abdomen was greatly distended. Occlusion of the duodenum below the ampulla of Vater was suspected. Operation was performed under local anæsthesia. The entire jejunum, completely collapsed and the size of a child's duodenum, lay in the true pelvis. The stomach and duodenum were enormously distended. This distention ceased at the juncture of the duodenum and jejunum. Here the duodenum was kinked by the tense mesentery. The mesentery showed distended veins. On the posterior wall of the stomach was an old callous ulcer. A posterior gastro-enterostomy was done. At first there was slight improvement. On the third day after the operation death followed marked inanition symptoms.

At autopsy the small bowel was found in the true pelvis. The mesentery was extremely tense. Near the site of the anastomosis the jejunum was filled with fluid. The stomach and duodenum were distended. The ulcer on the posterior wall of the stomach extended to the lower horizontal part of the duodenum and was adherent to it. After suspension

of the jejunum the duodenal lumen permitted the introduction of two fingers. By the fixation of the lower portion of the duodenum the effect of the arteriomesenteric occlusion had been aggravated.

In the discussion of this paper Grekoff denied the possibility of an arteriomesenteric occlusion of the duodenum in general and in the case reported in particular. In his opinion, all such cases belong to the group of acute dilatation of the stomach. Positive anatomical proof of mechanical closure of the duodenum is not at hand.

Fedoroff stated that he regards arteriomesenteric occlusion as a clinical entity but that this type of ileus occurs in greatly emaciated persons.

Hesse attributed the increase in arteriomesenteric occlusion of the duodenum to the present emaciation of the Russian people. Acute gastric dilatation was observed previously and can be differentiated fairly well from arteriomesenteric occlusion of the duodenum. Hesse mentioned a series of cases observed in Petrograd hospitals. In one case of chronic duodenal closure in which the diagnosis was proved by operation and autopsy the patient was unable to obtain relief during the attacks of pain except in an elevated pelvis position and he assumed this position on his own initiative, raising his limbs high up against the wall and supporting his head and body by pillows. Hesse stated that on the basis of his own experience he did not agree with Grekoff regarding the differential diagnosis of acute dilatation of the stomach and arteriomesenteric occlusion of the duodenum but accepts the views of von Haberer. In cases of acute duodenal closure operation is not indicated. In chronic cases nothing else avails, but a simple gastro-enterostomy or a duodenojejunostomy as recommended by American surgeons is not sufficient. Restoration of the bowel is of secondary importance to the relief of the shock due to the traction on the mesentery. Therefore the jejunum must be raised from the true pelvis and its subsequent descent must be prevented. Worthy of trial would be a gastro-enterostomy combined with fixation of the first portion of the jejunum to the greater curvature of the stomach.

Oppel's suggestion to divide the mesenteric artery and re-implant it into the aorta lower down is not to be recommended as possible thrombosis at the site of suture would lead to gangrene of the entire small intestine.

HESSE (Z).

Judd, E. S.: Jejunal Ulcer. *Surg., Gynec. & Obst.*, 1921, xxxiii, 120.

Gastrojejunostomy for gastric or duodenal ulcer gives a good prospect of complete and permanent relief of symptoms. Jejunal ulcer is one of the most serious and most common complications of gastro-jejunostomy. It may occur in the line of anastomosis or below it. As a rule, jejunal ulcer is a single lesion, but if it develops at the line of anastomosis it is apt to be multiple. Edema and adhesions of the surrounding tissue suggest slow leakage from a small perforation.

In 4,324 gastro-enterostomies done at the Mayo Clinic 55 definite secondary ulcers were found on the jejunal side of the efferent loop. The lesion was found in 46 patients who had had gastro-enterostomies before entering the Clinic.

High acidity plays an important rôle in the etiology of this condition, as it does in primary ulcers. In not a single case in the author's experience did a jejunal ulcer develop unless there had been an ulcer as the indication for gastro-enterostomy. Any disturbance which permits unneutralized acid chyme to reach the jejunum offers an opportunity for the development of a jejunal ulcer. Permanent suture material is another factor in the production of many ulcers. This was found in 9 of the 55 patients who had had gastro-enterostomies done at the Mayo Clinic, and in 17 of 46 patients who had had gastro-enterostomies elsewhere. Trauma of the tissues at operation and infection are factors of indefinite importance.

The time of the onset of symptoms after gastro-enterostomy varies from almost immediately to ten years. The average is from six months to one year. The pain is usually not so severe as that caused by the primary operation and occurs more to the left. Relief following the ingestion of food and soda is not so complete. Hæmorrhage into the stomach or bowel is not common in case of secondary ulcer, but when it occurs is very suggestive of ulcer.

Judd knows of only one case in which perforation occurred into the peritoneal cavity. In six cases in the series of 101 there was perforation into the colon with the formation of a colonic fistula. Persistent diarrhoea, stercoraceous vomiting, and belching of foul-smelling gas are the first symptoms to attract attention to the condition. If the fistula is small, these symptoms may be periodical. Emaciation may become marked. X-ray examination will demonstrate the lesion.

Jejunal ulcer is always to be suspected when a recurrence of symptoms follows an interval of relief after gastro-enterostomy for ulcer. Malignancy and inflammation of the gall-bladder and appendix must be considered and ruled out. X-ray examination is the best aid in the differential diagnosis.

Prophylactic removal of foci of infection is important in the treatment of this condition. Reduction of operative trauma and the avoidance of non-absorbable suture material will decrease its frequency. If medical treatment for a reasonable time fails, surgical treatment is indicated.

The best method of operation consists in undoing the gastro-enterostomy, excising the jejunal ulcer, closing the openings into the stomach and duodenum, and excising the original ulcer. A plastic operation may be done on the pylorus, if indicated. If a gastrocolic fistula is present, the tissues should be carefully dissected free and the openings in both viscera closed.

The results of operation in the cases reviewed have been reasonably satisfactory. Proper dietetic and medical management following operation are of great importance in preventing the formation of new ulcers.

MERLE R. HOON, M.D.

Ssozon-Jaroschewitsch, A. J.: The Variations in Form and Position of the Sigmoid Flexure (Form und Lagevarianten der Flexura sigmoidea). *Verhandl. d. 6 Konferenz der Wiss. Med. Ges.*, Petrograd, 1921, v, 31.

The ingenious research of Schewkunenko, who studied the variations in form and position of the organs of human and animal bodies in a large number of investigations and in an original manner, cleared up convincingly the question of topographical variations. The work of the Schewkunenko school is of great value to the surgeon. An understanding of variation forces us to relinquish a division into normal and abnormal as there are types of body structure which closely approach the physiological demands of nature (perfect types), and others, belonging to the lower animals, which are less perfect. Each of these types is distinct and may be differentiated from the other on the basis of certain exterior signs. The variation in form and position take place in accordance with topographical laws. These laws, laid down by the Schewkunenko school, make possible a topographical classification during life on which the choice of operation may be based.

The author's anatomical research concerning the variations in form and position of the sigmoid flexure were carried out on 101 cadavers which ranged in age from 70 years to the sixth embryonic month. The following four types of variation of position were established:

1. A flexure in the form of a short and slightly bent tube with a short mesentery. The tube runs with scarcely any bend from the left iliac region to the left sacro-iliac synchondrosis. This variety is rare. It was observed in 8 per cent of the cases. It corresponds to the condition of the intestine in the third and fourth embryonic months and is to be regarded as indicating an arrest of growth. This is an imperfect type not suited to the physiological destiny of the flexure.

2. A relatively long flexure which, with its bends, lies above the pelvic inlet and to the left of the spinal column. The pole of the upper bend of the flexure lies not infrequently at the level of the lower pole of the spleen. The mesentery is longer than that in Type 1. Even in foetal life Type 2 is regarded as a separate type. It was noted in 27 per cent of the cases.

3. A flexure situated in the right half of the abdominal cavity. The mesentery in these cases is long. This type was noted in 11.6 per cent of the cases.

4. A flexure the loops of which do not leave the true pelvis. This flexure is of considerable length and forms a series of bends. The loops may be arranged either horizontally or vertically in the true pelvis. This type was noted in 53.4 per cent of the bodies.

The four types described appear in the human flexure, but are subject to various deviations which may be related to physiological and pathological changes in the organism. Clinical, and especially animal, experiments prove that the position and form of the flexure depends on its degree of fullness and the character of its contents. Through these influences

the different types may approximate one another, as for example is the case in the third and fourth types which have as characteristics in common a considerable length of intestinal tube and of mesentery. Types 3 and 4 come nearest to satisfying the physiological requirements and therefore are the most perfect.

From further anatomical research the author draws the following conclusions:

1. All variations in position and form have their anlage in the earliest stages of foetal life. Type 1 is due to arrest in embryonic growth. Type 1 may become Type 4.

2. The configuration of the pelvis has a distinct influence on the structure of the radix mesenterii. In the narrow (male) pelvis the insertion of the root of the mesentery is situated more vertically and the horizontal angle of inclination averages 52 degrees. Most of the intestinal loops lie vertically and the flexure tends to the vertical position. In the broad (female) pelvis the mesenteric root-insertion lies more horizontally and the horizontal angle of inclination is on the average an angle of 29 degrees. The intestinal loops lie horizontally and the flexure lies more horizontally than in persons with narrow pelvises.

3. The influence of age is seen most plainly in the mesenteric root. The mesenteric root was found to have its process at the level of the third lumbar vertebra in embryos; at the level of the fourth lumbar vertebra from the first to the tenth year; at the level of the fifth lumbar vertebra from the tenth to the twenty-fifth year; at the promontorium from the twenty-fifth to the fiftieth year; and at the sacrum in old age. With increasing age there is thus a sinking of the radix mesenterii from the third to the fourth vertebra. This occurrence is explained by the progressive loss of elasticity of the suspending ligaments. There may be also a premature sinking of the insertion of the mesenteric root.

A variety of pathological alterations are met with clinically that may complicate the pathology of the flexure. In the pathology of enteroptosis the flexure of Type 4 plays the greatest part. In such cases we have the most favorable preliminary conditions for ptosis. The flexure and the mesenterium are long and lie in the true pelvis. When the pelvis is wide and the thoracic aperture is relatively narrow the mesentery root lies more horizontally. When there is premature appearance of age evidenced by the too early wearing out of the ligaments the mesentery increases in length, the root sinks, and a ptosis of the flexure is produced which may lead to a series of pathological phenomena (atony of the intestine, constipation, prolapse of the rectum, volvulus, etc.).

SCHACK (Z).

Jean, G.: Recto-Colic Ruptures Due to Compressed Air (Ruptures recto-coliques produites par l'air comprimé). *Presse méd.*, Par., 1921, xxix, 675.

The literature on injuries due to the use of compressed air in industry is rather scant. The American

literature from 1911 to 1914 contains a few reports on the subject but altogether the author has been able to find the records of only twenty-three cases. To these he adds two of his own. In the latter the compressed air was injected into the anus, in one case accidentally, in the other designedly.

It has been found experimentally that human and animal detached intestines rupture when air is injected into them under a pressure between 2 and 5 atmospheres. The suddenness of its introduction, however, is also a very important factor. The recto-colic juncture usually bears the brunt of the injury. The sigmoid is the first to rupture, but there may be multiple ruptures involving the entire colon. There is a very great difference between the lesions of the external intestinal tunic and those of the mucosal tunic. While the external coat is much torn, the mucosal coat resists for a longer time. In the author's two cases the wall of the sigmoid was composed of the mucous layer only which herniated through the ruptured external layers. In the external coats a longitudinal and a transverse rupture were found.

The symptoms are those due to intestinal rupture and shock. The diagnosis is simple. The prognosis is grave. Of the twenty-five collected cases, nine not operated upon were fatal. Of the sixteen others operation saved life in seven, including the author's two cases. The operative mortality is therefore 57 per cent.

When the intestinal perforations are multiple, which is usually the case, and when the intestine is reduced to its mucosal coat alone, suture is useless. If the patient's condition is poor following such injuries the intestine should be brought to the surface and fixed to the abdominal wall to form an artificial anus. If this method, which is only an expedient in lieu of something better, is not possible, an enterectomy with a colo-colic or colo-rectal anastomosis is indicated. In Jean's cases a colo-rectal anastomosis was impossible because of the condition of the rectum. The upper stump of the colon was therefore fixed to the abdominal wall as a permanent artificial anus. Both of the patients made excellent recoveries.

W. A. BRENNAN.

LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

Mastrosimone, F.: Cholecysto-Gastrostomy; Four Operations for Permanent Obstruction of the Common Duct with Recovery (*La cisticogastrotomía. Cuatro operaciones de cisticogastrotomía por obstrucción permanente del coledoco, con curación*). *Semana méd.*, 1921, xxviii, 193.

The creation of an artificial outlet between the bile ducts and the gastro-intestinal tract is indicated whenever the normal evacuation of bile into the duodenum by the common duct is prevented by an irremediable cause or technical operative difficulties.

Mastrosimone reviews the various operations which have been devised for this purpose. Of

these he prefers cholecysto-gastrostomy. It has been proved both experimentally and clinically that bile introduced directly into the stomach does not disturb gastric digestion. The coagulation of albumin in the stomach by the action of bile and the consequent precipitation of pepsin is remedied later by the continued secretion of gastric juice which redissolves the albuminoids, liberates the pepsin, and increases the alkalinity of the bile. Another reason why it is better to anastomose the bile ducts to the stomach instead of to the intestines is that the stomach has fewer bacteria and therefore is less apt to be the source of an ascending infection of the biliary system.

The cystic duct has been anastomosed to the duodenum, jejunum, or transverse colon by other surgeons but its direct union with the stomach was effected for the first time by Mastrosimone in 1917. Since then he has performed this operation in three other cases. He believes it is better to join the cystic duct instead of the common duct to the stomach as this procedure is less dangerous and more rapidly executed, and gives better end-results. The conditions essential for the operation are complete permeability of the duct to be anastomosed and the absence of any infection. If infection is manifest or suspected the biliary tract must be drained for twenty to twenty-five days before the anastomosis is attempted.

The anastomosis should be effected end-to-side by invaginating the free extremity of the cystic duct into a small buttonhole opening in the prepyloric portion of the posterior surface of the stomach, an area in which the vascularization is slight. The duct should penetrate for about 1 cm., and should be held in place by fixation sutures and two rows of circular seromuscular sutures, the interior row of catgut and the exterior row of fine silk. A small gauze drain should be left in the wound for six or eight days.

Between 1901 and 1921 Mastrosimone has performed three cholecysto-duodenostomies, two choledocho-duodenostomies, 1 transmesocolic cholecysto-jejuno-stomy, 1 cystico-colostomy, and 4 cystico-gastrostomies.

Of the four patients subjected to a cholecysto-gastrostomy three were men and one was a woman. In the male patients pre-operative biliary drainage was not necessary but in the woman both pre-operative biliary and gastric drainage were indicated. The end-results in the four cases were most satisfactory. No digestive or biliary disturbance has been noted; the general condition has been excellent since the operation, three months, two, three, and four years respectively in the four cases. The ages of these patients ranged from 30 to 53 years.

W. A. BRENNAN.

Sistrunk, W. E.: The Surgical Removal of Pancreatic Stones. *Ann. Surg.*, 1921, lxxiv, 380.

Although pancreatic stones have been found occasionally at autopsy, a review of the literature

reveals very few reports of their surgical removal. The records of the Mayo Clinic show only four such cases during eleven years. In one of these patients the stones were removed through an incision in the anterior wall of the duodenum; the ampulla of Vater was opened and several stones were removed from a diverticulum in the head of the pancreas situated very near the common duct. In another patient, who had diabetes and stones in the common duct, the pancreas was exposed through an incision in the gastrocolic omentum. Both of the pancreatic ducts were filled throughout with stones. Four incisions were made along the duct of Wirsung and the stones were removed with a scoop. Several stones which were impacted in the duct near the ampulla were removed through an incision in the mesentery of the duodenum. In the cases of the other two patients the stones, which were impacted in the duct near the ampulla, were removed through openings made through the mesentery of the duodenum.

The presence of stones in the pancreas was first reported by Graaf in 1667, and the first record of the surgical removal of pancreatic stones was that of Gould in 1896.

Stones associated with diabetes have often been reported. It is difficult to say just what relation they have borne to the diabetes, but it is probable that both the diabetes and the stones resulted from inflammatory changes in the pancreas.

Up to the present time very little surgery has been done on the pancreas proper. Nearly all operations which have been done for pancreatitis have consisted of drainage of the gall-bladder or common duct. Experimental work by Opie, Coffey, Sweet, and others has tended to prove that surgery of the pancreas is not necessarily attended with the great risk which it was formerly supposed to carry. The surgical removal of pancreatic stones is not difficult except in cases in which the stones are impacted close to the ampulla.

Operations in which tumors have been removed from the pancreas have been successful; even segments have been removed and the two ends of the pancreas united. The ducts of the pancreas contain no valves and in cases of obstruction in the head of the pancreas it is possible to drain the pancreas by some modification of the operation described by Coffey or by Link.

Coffey experimentally ligated the duct near the ampulla and, after cutting off the end of the pancreas near the tail, transplanted the tail into the jejunum. Following this procedure he found that the pancreas emptied itself satisfactorily. Link operated for pancreatic stones by exposing the pancreas through an opening in the transverse mesocolon. The blood supply from the splenic vessels along the upper border of the tail of the pancreas was cut. The tail was lifted from its bed as far toward the right as the superior mesenteric artery, then drawn out through the opening in the transverse mesocolon, and brought up to the skin.

The duct of Wirsung was opened for a distance of 2 or 3 in. and the stones removed. A catheter was then placed in the duct and the tail of the pancreas sutured to the skin. Experimentally, fat necrosis occurs only when pancreatic juice is allowed to remain in contact with retroperitoneal fat. Pancreatic fluid causes no harm to the peritoneum if sufficient drainage is placed to conduct the secretions to the surface.

MISCELLANEOUS

Babcock, W. W.: Morbidity After Operative Treatment in Abdominal Surgery. *Med. Rec.*, 1921, 7, 319.

In a large number of cases there is no relief of symptoms after operation. For this there are three chief explanations:

1. The cause of the original symptoms was extra-abdominal and operative treatment was a therapeutic mistake.

2. An intra-abdominal lesion giving symptoms was present, but was not recognized by the operator and the wrong operation was done.

3. The operation was a technical failure because it either failed to do what was intended, added new pathologic conditions which caused a continuation of the old symptoms, or created new symptoms.

In cases of the first group frequent causes of error are pneumonia on the right side associated with pleurisy which, because of referred pain in the abdomen, is diagnosed as appendicitis, and pulmonary tuberculosis with gastric symptoms simulating those of gastric ulcer. In this condition a careful X-ray examination of the chest is less apt to be wrongly interpreted than an X-ray examination of the stomach. In other cases cardiovascular diseases may simulate gall-bladder disease. Gastric attacks due to metabolic disturbances, backaches due to toxæmia, faulty static conditions, spinal disease, and sacro-iliac relaxation are frequently attributed to a retroverted uterus or a ptosed kidney. Occasionally operations on the stomach are performed on patients suffering from lead colic, Pott's disease, or tabes.

In cases of the second group careful exploration of the abdomen may show that gastric symptoms were due to an encapsulated pelvic abscess or an old ectopic pregnancy, that ureteral colic was the cause of appendiceal symptoms, and that a case thought to be a fibroid uterus was not helped by the removal of small fibroids because the real trouble was a carcinoma of the splenic flexure. An appendix may be removed when gall-stones or ulcer is the cause of the condition. Hypernephroma and mobile cæcum should also be borne in mind.

In cases of the third group may be mentioned removal of epiploic appendices for the vermiform appendix, partial removal of the appendix leaving an infected stump, gall-bladder surgery in which a stone low in the common duct is overlooked, and operations for visceroptosis which fail to accomplish the desired result.

I. E. BISHKOW, M.D.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Tillier, R.: Skeletal Lesions Analogous to Rachitic Disturbances Appearing Late and Probably of Infectious Origin (*Lésions squelettiques analogues à des troubles rachitiques apparues tardivement d'origine probablement infectieuse*). *Rev. d'orthop.*, 1921, 3 s. viii, 399.

The author reports the case of a child, aged 14 years, who had grown normally until his eighth year, when he developed bilateral genu valgum and other deformities suggesting rachitis following an attack of erysipelas of the face and the upper part of the trunk.

Tillier remarks that it would be interesting to trace the relation of this delayed rachitis to the true rachitis of nurslings and to determine whether these two types can be placed in the same pathogenic class. In both conditions the bones are deficient in calcium but in the deferred type of rachitis Tillier has observed that the muscles show a peculiar increase in opacity to the X-rays which is not localized and suggests that some anomaly in the distribution of calcium salts may be responsible for a deficiency in the bony tissues and an over-supply in the muscles. Such an anomaly might arise from a disturbance of the endocrine glands.

An increase in the opacity of the muscles to X-rays is not observed in cases of true rachitis and this is an important difference between the two conditions. Rachitis in nurslings results from a defect in calcification due to failure of the organism to elaborate a sufficient supply for the bones, a failure of the function of nutrition. Deferred rachitis is the result, not of an absolute decrease in the organic production of calcium, but of some disturbance in its distribution to the tissues traceable to its regulators, the glands of internal secretion.

The author believes that in the case reported the disturbance in the endocrine glands was due to a streptococcal infection. The fact that erysipelas immediately preceded the onset of the rachitic disturbance cannot be considered as a mere coincidence. He is unable to state what particular gland was affected and is inclined to assume that the condition was a pluriglandular syndrome although the testicles in particular showed an arrest in development.

In deferred rachitis the bone lesions are situated chiefly in what the author terms the metaphysis, viz., the juxta-epiphyseal region. W. A. BRENNAN.

Naumann, H.: Osteomalacia and Osteitis Fibrosa (*Ueber Osteomalacie und Ostitis fibrosa*). *Deutsche Ztschr. f. Chir.*, 1921, clxiv, 1.

On the basis of two cases the author goes into detail regarding the relation of osteomalacia to osteitis

fibrosa deformans (von Recklinghausen) and to cystic degeneration of the bones. In the first case the condition was a long-standing, non-puerperal osteomalacia which, up to the time of a fall seven years previously, had been entirely symptomless. Subsequently there had been increasing pain, numerous fractures from the least causes, and general softening of the bones which finally were followed by marasmus leading to death. Besides isolated typical findings of osteomalacia in the bones, the chief findings differed entirely from those of osteomalacia, but were typical of osteitis fibrosa. Of special interest was the fact that a tibia amputated one year before death showed relatively pure osteomalacia changes. Therefore in this case there was a mixture of both diseases or a transition from osteomalacia to osteitis fibrosa.

On the basis of this case and a case of non-puerperal osteomalacia, the author reviews the theories as to the genesis of osteomalacia on the one hand and of osteitis fibrosa on the other. He does not agree with Pommer's view that osteomalacia and rickets are due to a disturbance in the physiological building-up and tearing-down processes in the sense that the calcification of the newly formed bone substance is more or less deficient while resorption remains the same and that halisteritic processes of many perforating canals in the neighborhood are of only minor importance. Naumann believes with Marchand that there is an extensive halisteresis. Of special importance in osteomalacia is the appearance of fibrous marrow and its associated osseous changes (new formation of bone tissue in the spongiosa, resorption through lacunar resorption and perforating canals) which indicate that osteomalacia is a bone disease in which an extensive change takes place in the entire cross-section of the bone. In the perforating canals one sees the first stage of the hollowing-out process brought about by the activity of the osteoclasts.

The characteristics of osteitis fibrosa consist in a complete change of the bone and a quantitative change in the tissue in the sense that through metaplasia new bone is formed from the connective tissue of the proliferating fibrous marrow (analogous to the building of bone from connective tissue) and at the same time, as the result of increased resorption by the osteoclasts, bone is torn down. Cysts arise from traumatic bleeding or the disappearance of the inflamed newly formed tissue, the place of which is taken by serum.

As causes of primary non-puerperal osteomalacia must be considered early rickets, inherited nervous affections, and errors in diet. As causative factors of osteitis fibrosa must be considered for the greater part mechanical factors which, in the greatly changed bones, find a favorable field for action. Without doubt, traumatic factors also play a part as shown by the increased local changes in the tibia following a fall in the case reported. RÖHDE (Z).

Allison, N., and Brooks, B.: **Bone Atrophy: An Experimental and Clinical Study of the Changes in Bone Which Result from Non-Use.** *Surg., Gynec. & Obst.*, 1921, xxxiii, 250.

The fact that changes take place in the bones of the extremities when they are not used is generally known, but the exact nature of these changes has not been clearly defined. The purpose of the experiment and clinical study reported in this article was to determine the effect of the non-use of bones as it concerns: (1) X-ray photographs, (2) gross and microscopic anatomy, (3) chemical composition, (4) breaking strength, (5) growth, and (6) regeneration.

The experiments were carried out on dogs. Three methods were employed to prevent the use of the foreleg: (1) section of the brachial plexus resulting in partial or complete paralysis, (2) excision of the upper end of the humerus, resulting in a flail-joint, and (3) plaster of Paris fixation. When the experiments were terminated the bones of both forelegs were compared on the basis of the X-ray examination and their measurements, weights, chemical composition, and breaking strength.

For the study of the effect of non-use on regeneration the animals in which one foreleg had been subjected to varying periods of non-use were operated upon again. A section of each ulna was removed, the defect in the atrophied ulna was bridged with a transplant of bone with periosteum and marrow from the non-atrophied ulna, and the defect in the non-atrophied ulna was bridged with a similar transplant from the atrophied ulna. This operative procedure gave in each animal two transplants in similar defects in each ulna. One transplant was atrophied bone placed in an extremity which was used and the other a non-atrophied bone placed in an extremity which was not used. The results of these experiments were studied by means of the X-ray and macroscopic examination.

The X-ray photographs of non-used bone revealed changes which are the same as those observed in a human extremity which has not been used. The earliest changes were noted in the cancellous extremities of bones (experiments of shortest duration seven to thirty days). The shadows of the trabeculae became less defined, producing an effect suggesting imperfect radiographic technique. In addition there were irregular areas in which the trabeculae had disappeared entirely.

In experiments of longer duration (from thirty to one hundred days) a well-marked change made its appearance in the compact bone of the shaft. This consisted of a decrease in the diameter of the shaft of the bone and an increase in the diameter of the medullary canal.

In experiments of the longest duration (from one hundred to three hundred and fourteen days) the trabeculae were well defined but very small and relatively fewer. The compact bone of the shaft was further diminished in thickness and showed longitudinal striae of diminished density.

The initial changes in the gross anatomy of bone due to non-use are the same regardless of the age of the individual but the ultimate result is different in an individual who has reached his complete growth from that in an individual who is in his growing period. In the former only the process of bone atrophy is operative while in the latter this process is associated with the process of bone growth which is inhibited, but not arrested, by non-use. In the investigation reported both growing and adult dogs were used in the experiments of relatively short duration, from ten to two hundred days, and only adult dogs were used in the experiments of longer duration, from two hundred to three hundred and fourteen days. The ultimate changes in the gross anatomy of the bones due to non-use beginning before the completion of growth have been shown by Howell in illustrations and measurements and by the effect of poliomyelitis, tuberculosis of the bone, and congenital or acquired deformities in childhood.

The first change noted in the examination of a bone of an extremity which has not been used is in the relationship between the periosteum and the compact bone of the shaft. In the normal bone the periosteum strips with ease, leaving a smooth glistening surface. In atrophied bone the periosteum strips with difficulty and leaves a surface which feels like fine sandpaper. A further change which then becomes evident is in the character of the cortical bone of the shaft, which loses its compact structure and becomes porous. The porosity of the bone explains the linear striae of the shafts seen in radiograms. It is to be emphasized, however, that none of these changes affect to any marked degree the general shape and contour of the bone as a whole. The diameter of the shaft is only slightly decreased and its length is not changed.

During growth there is a striking difference in shape compared with the corresponding bone of the used extremity. The bone is smaller both in length and thickness. The decrease in thickness is more noticeable than that in the length. Furthermore, the diminution in thickness is more marked in the shaft than in the epiphysis, producing an effect of sudden enlargement at the epiphyseal region. The periosteum strips from the bone normally. On cross-section of the shaft the thickness of the cortex relative to the diameter of the bone shows a change which is very slight as compared with that seen in bone atrophy occurring during adult life. Comparative measurements of the thickness of the entire bones and the diameters of the medullary canals show that the medullary canal of the non-used bone is always larger relative to the thickness of the same bone although it may be actually smaller than the medullary canal of the corresponding bone of the used extremity. There may be also a difference in the shape of the cross-section as compared with the non-used limb.

These experiments showed that non-use has no effect upon the chemical composition of the bone

matrix but that an entire bone may lose more than a quarter of its mineral constituents during twenty-four days of non-use. In some experiments in which the non-use continued for one hundred and ninety-five days and there had been a marked diminution in the thickness of the cortex of the shaft, it was found that there was no appreciable difference in the chemical composition of this cortical bone when it was compared with the cortical bone of the used extremity. Therefore the loss of mineral constituents due to non-use of a bone is a loss of bone matrix rather than a loss of mineral constituents of the bone matrix. The change is quantitative rather than qualitative.

The degree of atrophy of the bone was directly proportional to the degree of non-use, regardless of the method employed to prevent the use of the extremity. There is no evidence warranting the assumption that any disease process plays any rôle in the production of bone atrophy other than its effect on use. That bone atrophy is not the result of diminished circulation of blood is shown by the fact that it develops rapidly in the acute inflammatory diseases and by a case in which, following ligation of the popliteal artery, there was a diminution of the blood supply to the leg sufficient to cause complete ischaemic paralysis and slowly developing gangrene but the tibia showed no evident atrophy after a period of four months.

Bone absorption is an active process and a circulation of blood is necessary to its progress. The progress of bone atrophy is not a change in the characteristics of bone as a tissue or a substance but a change in the amount of bone. This affects the size, shape, thickness, length, weight, and texture of the whole bone and accounts for the changes in its gross anatomy.

S. C. WOLDENBERG, M.D.

Sosman, M. C., and Canter, N. M.: **Primary Tumors of Bone.** *J. Radiol.*, 1921, ii, 1.

Recently the authors had under observation a group of cases of bone tumors at the Walter Reed Hospital, Washington, D. C. Realizing the difficulty in determining the exact nature of such tumors they believe it would be of value to give a complete report of each case. Although the roentgenological appearance is not always pathognomonic, it is conceded to be the most efficient aid to the diagnosis and furnishes the most reliable information prior to operation. The most frequent errors in roentgenological interpretation are the reporting of syphilitic periostitis as periosteal sarcoma and of the central destructive lesion as osteomyelitis.

CASE 1. The patient was a man 39 years of age who came for treatment for a lump on a finger. About four years ago he had an infected finger. On his admission to the hospital the X-ray showed a definite increase of bone destruction and production. The diagnosis was sarcoma. Bloodgood saw this case and changed the diagnosis to osteochondroma. The growth was removed *in toto* with a margin of healthy

bone. In this case the differentiation by means of the X-ray alone was difficult as there was a bone-producing tumor of periosteal origin with slight cortical destruction at its base. Sarcoma of a phalanx is very rare but no doubt does occur.

CASE 2. The patient was a male 20 years of age who complained of swelling of the wrist. Eight years ago the wrist was broken but healed normally except for a slight deformity. The X-ray diagnosis made at the camp hospital was fracture with excess callus. Later a diagnosis of sarcoma was made at the base hospital and amputation was advised. The patient having been informed that this was probably a benign tumor, refused operation.

CASE 3. The patient was a man 27 years of age who complained of pain and swelling in the right knee joint. There was no history of trauma. Three months after the onset of the condition the knee was explored for tuberculosis and a piece of tissue was removed and stained for tubercle bacilli. The findings were negative but there was a purulent discharge from a small sinus. The X-ray diagnosis was osteomyelitis. The wound was treated with Dakin solution and healed slowly from its base. Five months later another X-ray showed progressive destruction. At the same time a small swelling in the scar was tapped and found to contain blood. In Bloodgood's opinion the tumor was malignant. The patient preferred amputation with quick results rather than resection with grafting and long hospitalization. Microscopic examination by Bloodgood showed an encapsulated giant-cell tumor of the epulis type which did not invade the cartilage or the scar of operation. This case illustrated the fact that perforation of the cortex does not always mean malignancy as this has been noted also in bone cysts, pure myxoma, and chondroma.

CASE 4. The patient was a male 30 years of age. The complaint was pain and disability of the right shoulder for the past nine years. An X-ray examination made in 1912 was negative. In 1916 pain recurred with swelling and for the first time there was marked disability. The X-ray examination at this time showed a bone shell with marked expansion in the region of the great tuberosity and markings suggesting a multi-cystic tumor. In 1916 the great tuberosity, a piece of the shaft, the bicipital groove, and part of the lesser tuberosity were removed. The operative diagnosis was typhoid osteomyelitis but the microscopic report showed hemangioma cavernosum. Pain recurred three months later and a second operation was performed. In April, 1920, the patient was seen by Garré of Bonn University, Germany, who X-rayed the shoulder, made a diagnosis of sarcoma, and advised immediate operation. The patient was returned to New York for a third operation. At that time cartilage, a bone spur near the joint the size of the end of a finger, tissue resembling blood clot which was embedded in bone, and old scar tissue were removed. The surgeon's opinion was again granulated tissue but the pathologist's report was

angio-cavernoma of the bone. Bloodgood believed the roentgenogram suggested the healing process of a central lesion with periosteal bone formation of the thigh like that found in osteomyelitis. Hitzrot stated that the patient is bound to have some pain because of the chronic arthritis; he recommended baking and massage but not resection. Physiotherapy was without effect. The only relief was given by fixation and traction. The patient was discharged from the service.

CASE 5. The patient was a man 25 years of age who had had pain and swelling in the knee for the past eight months. The bone detail was very indistinct in the X-ray picture because of the presence of a huge soft-tissue swelling. Multiple small areas of bone destruction with very slight new bone formation, apparent perforation of the cortex at several points, and destruction of the articular surface of the medial condyle were found. A diagnosis of tuberculosis was made. On consultation this diagnosis was changed to sarcoma. Although the articular surface of the femur was partially destroyed, the tibia opposite showed no involvement, this being strongly against tuberculosis.

CASE 6. The patient was a man 43 years of age who complained of pain and swelling of the right shoulder for the past eight months. In 1919 he had noticed that a small area in the right shoulder was becoming painful and very tender to the touch. The X-ray showed expansion of the upper end of the humerus extending through the epiphyseal line into the head of bone. This expansion was symmetrical but the involved area was cloudy and appeared lobulated rather than smooth as in bone cysts or mottled as in older bone cysts or giant-cell tumors. The cortex appeared to be almost destroyed in certain areas and there were fine perpendicular lines of new bone formation. The Wassermann test was negative. The X-ray findings led to the diagnosis of a low-grade inflammatory process probably due to syphilis. Bloodgood, however, insisted that the condition was malignant but it was generally agreed that a course of salvarsan should be given. The patient received six doses of salvarsan between Sept. 11 and Oct. 2 but without the slightest benefit. Radium therapy also was given but without any relief of symptoms. Another X-ray examination five weeks later showed a definite increase in the size of the tumor and cortical destruction. An operation was therefore done. Seven weeks later the patient was free from all pain, had gained weight, and had a fair amount of motion in the shoulder.

CASE 7. This case was similar to Case 1. In November, 1919, the X-ray showed metastases to the tarsus and the condyle of the femur. Amputation was performed in the middle third of the thigh. In May, 1920, the patient was fitted with a permanent artificial limb. In July, 1920, he twisted his stump in a minor accident and afterward was unable to wear the artificial limb comfortably. The X-ray showed a large cystic defect in the femur just

below the lesser trochanter and slight explosive destruction of the cortex. The diagnosis was metastatic sarcoma involving the femur. The patient was operated upon in October, 1920. At the time of the operation a large blood-filled cyst with a "velvety" lining of tumor tissue was found. The diagnosis based on a section was sarcoma. This case showed an unusual spread by metastasis primarily to bone and to the bones of the same limb in an ascending direction. The authors state that, as curettage had not been done, thorough treatment of the original lesion with the X-ray or radium might have prevented the subsequent metastasis. This shows the necessity of recognizing the type of tissue which is found in even minor operations. The presence of a blood-filled cyst in bone should suggest malignancy and resection of tissue should be done at once.

S. C. WOLDENBERG, M.D.

Isaac, S.: **Multiple Myeloma** (Die multiplen Myelome). *Ergebn. d. Chir. u. Orthop.*, 1921, xiv, 325.

By the term "myelomata" is meant multiple primary growths of the osseous system arising from the bone marrow and consisting histologically of parenchyma cells of the marrow. Sternberg states that, according to the type of the predominating cells, these may be differentiated into myeloblastic, myelocytic, lymphocytic, plasmocellular, and erythroblastic myelomata. The relatively small number of cases of myeloma shows that it is a rare affection, the proper classification of which has been much disputed.

Myeloma generally affects numerous bones in the form of multiple, circumscribed tumors, or more rarely, as a diffuse growth filling up the entire cavity of the affected bone. A primary tumor usually cannot be discovered, although there are cases with an especially large tumor in one bone which might be regarded as the primary growth from which the others developed. Short and flat bones are more frequently affected than the long bones. In the short and flat bones the spongiosa soon disappears. Later, the cortex becomes thinned, and subsequently there are bone deformities, bending, and fractures. In severe cases, marked changes occur in the shape of the skeleton. In only a few cases does the process remain limited to the bone marrow.

Myeloma has the power to absorb bone substance and cause osteoporosis. In some cases changes occur in other parts, such as the liver (myeloma nodules), the kidneys, the lymphatic system, the tonsils, the gums, the ovaries, the adrenals, the gastric serosa, the pleuræ, the mediastinum, and the meninges. As already mentioned, the histology is very different according to the type of cells that prevails. The clinical picture is variable and independent of the type and extent of the skeletal changes. The pains are often atypical and obscure. Nervous symptoms are often of significance. The blood picture is particularly interesting. In general there is a more or less severe anemia. The urine shows the Bence-Jones albumin bodies. Albuminuria is one of the most important features pointing to multiple mye-

lomata (Hirschfeld) although it is not present in all cases. Skin changes are seldom noted. The body temperature is generally not raised. The course of the condition ranges from a few months to several years.

Myeloma is predominately an affection of middle and advanced years, although sometimes it occurs in youth. The diagnosis is not easy, especially in cases in which bone symptoms are very slight or absent and general symptoms, such as anæmia and cachexia or nervous disturbances, dominate the clinical picture.

The treatment is mostly symptomatic. Like other affections of the blood and lymphatic system, such as lymphosarcoma, myeloma occupies a peculiar place and stands in interesting relationship to malignant growths. GLASS (Z).

Troell, A.: On Tendovaginitis and Tendinitis Stenosans. *Acta chirurg. Scand.*, 1921, liv, 7.

In a previous paper the author mentioned seventy-eight cases of tendovaginitis crepitans and described four of them in detail. He considers over-exertion at work to be the most common etiological factor. More recently he has examined a case without crepitation which he believed was due to wood-sawing. A tender swelling was present over the abductor longus pollicis and extensor brevis pollicis.

In the last three years Troell has seen six cases of a condition affecting the styloid process of the radius which clinically resembled de Quervain's tendovaginitis stenosis.

The first case was relieved by hot hand baths for a period of two weeks although the condition recurs slightly following over-exertion.

The second case was relieved by operation. The tendon of the abductor longus pollicis showed a slight but distinct fusiform swelling immediately below the lower margin of the dorsal carpal ligament. After section of the latter in the longitudinal direction the tendons of the abductor longus pollicis and extensor brevis pollicis were free and the thumb could be moved more easily.

The third case also was operated upon but was not relieved. The fourth case was slightly benefited by hand baths. Therefore operation was deferred. The author has no notes on two cases.

Histologic examination by Welti showed that the annular ligament lacked its usual shiny appearance and was strongly vascularized and infiltrated. The tendons of the abductor longus pollicis and extensor brevis pollicis were considerably compressed under the changed portion of the ligament. The condition was therefore interpreted as an inflammation of the tendon sheath, not of the tendon itself. De Quervain, Floercken, and Keppler found thickening in the wall of the compartment of the tendon sheath. Nussbaum observed only round-cell infiltration with small necrotic sections in the tendon sheaths. Marion says that the fusiform swelling is due to serous exudate in the tendon of the abductor longus pollicis. According to Poulsen, tenosynovitis results from pressure of the tendons

against the carpal ligament. Burke attributes the condition to habitual subluxation in the carpo-metacarpal joint.

Doigt à ressort is a condition which closely resembles stenotic tendovaginitis from a pathologico-anatomical point of view. A typical case is cited by Poulsen. The patient, a seamstress, felt a cramp-like pain in the left arm which extended from the thumb. The thumb had a clicking sensation on active extension. Operation showed a fibroma the size of a hemp-seed on the abductor longus pollicis tendon. Removal of the tumor entirely relieved the symptoms. RUDOLPH S. REICH, M.D.

Patel, M.: A Variety of Tuberculous Coxalgia in the Adult: Dry Caries of the Hip (Sur une variété de coxalgie tuberculeuse de l'adult: carie sèche de la hanche). *Rev. d'orthop.*, 1921, 3 s. viii, 385.

Dry caries of the hip, a condition which seems especially common in the young and in adolescents, is characterized anatomically by an osteo-arthritis with eburnation of the head of the femur but without fungosity or articular effusion. This dry coxalgia may evolve to the complete disappearance of a part of the upper end of the femur, especially the head and neck.

Patel reports a case of tuberculous arthritis of the right hip with progressive disappearance of the femoral head and neck in a woman 52 years of age. There was no doubt as to the tuberculous nature of the lesion as the patient had been tuberculous since her sixth year. It appeared that the disease evolved in two periods within a few years. The first was a period of arthritis with pain, muscular atrophy, functional impotence, and limitation of movements. The second was a period of osseous destruction lasting about a year which began when the patient attempted to walk by the aid of a prosthetic apparatus and a cane. The luxation produced, and the continuous friction of the upper extremity of the femur against the external surface of the hip bone completed, the destruction of the rarefied and softened osseous tissue.

The general characteristics of dry caries of the hip are analogous to those of the same condition in the shoulder, but because of the mechanical action of walking, the evolution of the two processes may be quite different. In the shoulder, ankylosis frequently results but this is not observed in the hip, the stump of the femur remaining loose and luxated. It is possible, however, that ankylosis might be induced in the hip by immobilization for a sufficiently long time. W. A. BRENNAN.

Kortzeborn: Femur Shortening with Myogenous Stiffening of the Knee Joint in Extension; Quadriceps Contraction (Ueber Femurverkürzung bei myogener Versteifung des Kniegelenkes in Streckstellung [Quadricepscontractur] an derselben Extremität). *Beitr. z. klin. Chir.*, 1921, cxxiii, 241.

Kortzeborn describes the case of a man on whom, five years after a gunshot fracture of the upper

thigh, Payr did an intracallus oblique osteotomy and reduced a shortening from 10 to 4 cm. Nail extension through the femur was used as in the Leipzig clinic with the Zuppinger semiflexion method, so that a weight of only 20 lb. was sufficient. In shortening of the femur due to gunshot fractures there is often at the same time marked contraction of the quadriceps muscle which stiffens the knee in a position of extension. In the Leipzig clinic there were eighteen such cases with femur shortening up to 10 cm.

It is therefore a question which condition should be treated first, the femur shortening by a lengthening of the bone, or the muscle contraction by a lengthening of the muscle. Consent is seldom obtained to perform both operations, one after the other. If the bone is lengthened the condition of the muscle contraction is made worse and the necessary over-extension of the muscle may lead to atrophy and lessen the possibility of properly treating the muscle and obtaining a knee free from stiffness.

In the Leipzig clinic it is believed that the removal of the stiffness and the obtaining of a useful joint are of the first importance, and the patients themselves have expressed this preference. A leg shortening up to 10 cm. with a properly fitted shoe and adjustments can be well handled, but not a knee stiff in extension. The latter condition interferes with the patient's work. As the patient's stay in the hospital following the operation on the muscles is much shorter (five to six weeks), the State should be interested in the correction of the knee stiffness by attention to the muscles. Kirschner emphasizes the fact that by improving the femur shortening the State saves itself the sum of money that it once paid out to every one injured in war whose deformity was as much as 5 cm. of shortening. Moreover, osteotomy is a much more dangerous procedure requiring much longer after-treatment. Hence, the simpler muscle plastic operation is to be preferred.

In conclusion Kortzeborn describes the cases of two patients with femur shortening and quadriceps contracture at the same time on whom he performed the muscle operation two and one-half and two years ago respectively, with the result that the previously stiffened knees are now active to 90 degrees and can be extended almost completely, while the shortening of the leg, 7 and 10 cm. respectively, is corrected by a shoe of corresponding height.

MARWEDEL (Z).

Saupe, E.: Patella Bipartita (Beitrag zur Patella bipartita). *Fortschr. a. d. Geb. d. Roentgenstrahlen*, 1921, xxviii, 37.

The cases of patella bipartita reported in the literature may be divided into three groups:

1. Those in which there are two pieces separated by a transverse slit. The total long diameter of the two together is greater than that of the normal knee cap.

2. Those in which there is a vertical split.

3. Those with a larger inner and lower portion and a smaller upper portion.

The cause of the formation of two knee caps must be an anomaly in ossification. According to the X-ray findings, the beginning of normal ossification is in the sixth year of life.

The author describes one of his own cases belonging to the first group. Patella bipartita does not influence the function of the knee joint.

VON TAPPEINER (Z).

Jean, G.: Extra-Articular Tuberculosis of the Posterior Surface of the Patellar Apex (Tuberculose extra-articulaire de la face postérieure de la pointe de la rotule). *Rev. d'orthop.*, 1921, 3 s. viii, 393.

Primary tuberculosis of the patella has been recognized for a long time; more than 100 cases are found in the literature since 1888. The relative rarity of the condition is probably due to the slight vascularization of the bone. In the child an abscess tends to develop outside of the joint on the anterior surface of the bone; in the adult it tends to develop on the posterior surface.

The author reports two cases. Both patients were adults and in both the tuberculous process developed on the posterior surface of the patellar apex. In the adult about one-fifth of the posterior surface of the patella in the region of the apex is connected with the anterior bursa of the joint and is therefore extra-articular. In the child under 14 years of age the whole posterior surface is covered with cartilage. This explains the difference in the direction in which the abscess develops. Both of the author's cases were operated upon. In one case the patellar tendon was freed by lateral incisions and turned back, the osteitic areas in the posterior surface of the patella being curetted. The other case was treated by Calot injections and heliotherapy. The treatment of choice is curettage of the osteitic focus and excision of the abscess and fistulous tract.

W. A. BRENNAN.

Roeren, L.: Progressive Foot Deformities in Spina Bifida Occulta (Ueber progrediente Fussdeformitäten bei Spina bifida occulta). *Arch. f. Orthop.*, 1921, xvix, 1.

Spina bifida occulta is a malformation which occurs in the lower part of the spinal cord. It is formed in the first weeks of intra-uterine life when the closure of the medullary groove which forms the medullary tube is disturbed, and after this period it remains unchanged. The independence of the development of the posterior sensory roots accounts for the rarity of their involvement.

The clinical picture of spina bifida occulta indicates that the condition brings with it an increased irritability in the reflex and tone-controlling mechanism. There are also foci which lead to disseminated areas of paralysis in the muscles. The conus medullaris often shows on its posterior surface typical constrictions due to adhesions, which sometimes are

continuous to the skin surface or are covered by a mixed growth, a myofibrolipoma. Growths and adhesions may lead to progressive damage to the cord through laceration or pressure. Only rarely, however, do the symptoms indicate such a deep-seated injury. Nevertheless, the cooperation of both factors is not to be denied. In conjunction with the difference in growth of the healthy and the abnormal tissue, there is a lessening of the toleration limit of reciprocating-regulating control. In the initial stage of the cord injury as well as in cases of external injury there is hypersensitivity.

Muscles, bones, etc. develop in foetal life irrespective of their function from the growth energy in the cell itself. It is not until later that the effect of functional stimulation becomes more and more necessary to the organ and its form. Under certain circumstances even in the uterus functional stimulation may hold back the formative power within the cells and thus influence the tissue which will develop from them. In general, the effect of function is exerted first on the form of the limbs. When there is an increased demand on one limb the influence of function upon its form becomes more evident. As in the grouping of the muscles and the arrangement of the joints the development of pes equinus is favored, and as the functional disturbances in the muscles are chiefly spastic, the majority of cases show pes equinus, pes varus, pes cavus, and their variations and combinations. The muscle changes—shrinking and over-extension—are of a secondary nature, but do their part in completing the deformity. Abnormalities in both the external and internal structure of the bone and corresponding changes in the ligaments, fascia, joint capsule, etc. play an important part in fixing the deformity.

The treatment must first remove the damage to the cord. As the deformity in the central nervous system is not amenable to surgical procedures, one can hope only to remove growths, adhesions, and other external abnormalities. Efforts must then be directed to restoring the equilibrium of the muscles. Lastly, operations for the correction of marked bone deformities and shrunken fascia must be considered.

VON LOBMAYER (Z).

FRACTURES AND DISLOCATIONS

Sandes, T. L.: Recurring Dislocation of the Shoulder Joint. *Brit. M. J.*, 1921, ii, 321.

Traumatic dislocation of the shoulder joint may so damage the capsule that subsequent dislocation is caused by trivial injuries. The author believes that the tearing of the capsule is the chief etiological factor. Elongation of the ligamentous structures may be caused by the primary injury or a second dislocation occurring before repair is complete.

Most anatomists teach that the humerus is held in position by muscular action, the capsule acting as a check only in the extremes of motion. As proof of the importance of the capsule the author mentions the early dislocations which occur in degenerative lesions

of the shoulder in syringomyelia and tabes and the integrity of the joint in diseases associated with paralysis of the shoulder muscles.

Many operations have been suggested to relieve the condition. These vary from suture of the loose capsule and resection of the redundant part with repair of bony deformity to the removal of portions of the articulating surfaces to secure a fibrous or bony ankylosis. This last measure seems unnecessarily radical for the majority of cases.

A new method is described which has been used successfully in five cases. A suspensory ligament of fascia lata or silk is passed through a drill hole close to the head of the humerus from before backward, emerging posteriorly through the greater tuberosity. The posterior end is passed under the deltoid muscle up anteriorly to the outer end of the clavicle, then over and behind it, and finally down to the starting point. The fascial ligament is drawn tight with the arm at an angle of 45 degrees, the ends being overlapped and sutured. The arm is supported by a sling and kept at rest for six weeks.

J. I. MITCHELL, M. D.

Broca, A., and D'Intignano, M.: The Anatomical Evolution of the Hip After Reduction of Congenital Luxations (Evolution anatomique de la hanche après réduction des luxations congénitales). *Rev. d'orthop.*, 1921, viii, 353.

The authors have studied the anatomical and functional results ten years or later after the reduction of congenital dislocation of the hip. The final functional results are compared with corresponding roentgenograms. Complete relaxation was rare, occurring in only about one-tenth of the cases, but a slight degree of upward displacement and separation of the head of the femur was not unusual.

Of 357 cases studied, perfect reconstruction of the joint was found in only twelve. This was made evident not only by the gait but also by the roentgenograms. Such results are obtained usually in cases operated upon before the second year of age. Almost always after reduction of congenital dislocation of the hip the X-ray shows some osseous deformity. This, however, does not compromise function. It is typically a general deviation in varus and as a rule is found as a fundamental modification of the internal extremity of the neck of the femur at the cervico-cephalic juncture. In 115 of the cases examined this deformity was simple, but in 158 others was associated with varus of the neck. In some cases it was very pronounced. In only two cases was a cervico-trochanteric varus found.

A persistent valgus is more rare. It may be compatible with good function, but predisposes to relaxation as well as to ascent and separation of the head of the femur. The author shows a number of roentgenograms of this deformity.

Re-luxation seems more frequent in cases in which the head of the femur, having been primarily a

little high and flattened, sets in such a way that the conjugal cartilage is disposed obliquely downward and inward. In fifty such cases there were forty-five secondary ascensions, twenty of which were relaxations, and twenty-five dislocations to an upper false acetabulum. The relaxations resisted further treatment but in the cases of dislocation to a false acetabulum there was fair function.

The effects of walking and ossification may in time correct the varus. The progressive stages of correction are shown in several roentgenograms.

When operation is deferred until the child is older, the X-ray examination in later life will very often show that under pressure of the acetabulum the head has become flattened until its aspect resembles that of *coxa plana*. In rare cases the head may disappear.

As the child gets older the tendency is toward mechanical correction of the femoral neck in varus and of the head flattened in *coxa plana*. Almost all the patients walk well except when the result is compromised by some exceptional cause. It is rather astonishing that such excellent results can be obtained in spite of the bone deformities shown by the X-ray. Secondary and late reconstruction of the joint is much poorer in patients operated upon after the fourth or fifth year for unilateral luxation or after the fifth or sixth year for bilateral luxation. In such cases the end-result after some years is only fair or poor, even when the early results were favorable. Therefore it may be said that when the femoral head remains embedded after some months of walking relaxation is exceptional and progressive functional and anatomical improvement almost constant. It is interesting to note, however, that in children operated upon in two stages separated by an interval of about a year the anatomical end-result in the last limb operated upon is not so good as that in the first limb.

The article includes sixty concise case histories and 106 illustrations.

W. A. BRENNAN.

Ridlon, J.: Lessons from My Experience with Congenital Dislocation of the Hip. *J. Orthop. Surg.*, 1921, iii, 365.

Prior to 1892 the author used the traction method in reducing congenital dislocation of the hips but now states that this method is absurd as it always results in failure. From June, 1892, until December, 1900, he used the following procedure:

As a preliminary stretching the leg is pulled by assistants against the resistance from a towel through the crotch held by the operator. The operator then standing at the side of the patient away from the dislocated hip, flexes the thigh on the pelvis and winds his arm around the thigh from the front to the outer side, back, and inner side and outward across the groin. Grasping the thigh thus, he adducts, flexes, and lifts the head of the femur toward the acetabulum, and rotates it from side to side while he holds the pelvis down with the other hand. Obviously,

only a very easily reducible hip can be reduced in this manner.

In 1900 he began to try the Lorenz method which is as follows:

The patient being fully anesthetized, the capsule is stretched by fully flexing the straight leg until the foot is beside the ear and by carrying the leg backward and from side to side. A sheet folded obliquely is then passed between the legs and fastened to the head of the table, the perineum being protected with a rubber pad, and the leg is pulled by two or three assistants each bracing a foot against the table. When the stretching is deemed sufficient, the flexed knee is grasped by the operator, the thigh is flexed to a right angle and abducted, the tense adductor muscles are hacked off with the edge of the operator's hand, and the thigh is strongly abducted over a wedge-block used as a fulcrum below (back of) the neck of the femur, the opposite side of the pelvis being held down by an assistant. This is a severe method and resulted in several cases of paralysis and fractures of the femoral neck.

In 1904 and 1905 Ridlon reported some cases in which reduction was effected by means of the Bradford and the Bartlett machines. He states that both of these methods work on the mistaken theory that when traction is made on the limb the dislocated head passes downward and back of the socket and can be pried in by a lever from behind. It is only those more backward than forward of the middle of the socket in which this will occur. Moreover, pulling with the leg abducted pulls against the stretched adductor muscles, while pulling with the leg adducted, to relax the adductors, hooks the head against the rim of the socket, if there be any upper rim. All these bloodless methods, and all others that Ridlon knows of, are executed without any attempt by the operator to determine at any stage of the manœuvre the exact relation of the head to the socket. The plea Ridlon makes for his operation is that the head is put into the acetabulum in the easiest way, with the least possible damage, and with positive knowledge at each step of the relation of the moving head to the socket.

After several years' trial of the Lorenz method Ridlon gradually abandoned it, first discarding the stretching and then the wedge-block. He states that the first real advance came with the realization that in fully flexing the thigh and thus throwing the head low, one avoided the greater part of the tension of the adductor muscles and possibly of the Y-ligament as a hindrance and could utilize them as a help to replace the head. In attempting to lift the upper end of the femur forward with his fingers at the back and his thumb in front, he learned to recognize the relation of the head to the socket and could feel the head leave his fingers at the back and rise under his thumb in front just before it slipped into the socket. In the seventeen years in which he has used this method he has broken the neck of the femur only once, and in that case manipulation had been done by another surgeon for half an hour. He has also broken the shaft once.

The cases of patients under 2 years of age with shortening of less than 1 in. and of all over 5 years of age with shortening of over 2 in. should be excluded.

Many cases treated in past years are not reported because the records are either missing or incomplete. Of the cases of unilateral reduction done between 1904 and 1909, the hip is in the acetabulum in fifty-two and out in thirty-eight. Of the hips reduced between 1910 and 1915, thirty-four are in and fifteen out. Cases treated between 1915 and 1919, inclusive, show forty-five hips in and fourteen out. Since January 1, 1920, ten hips have been reduced, one of which has come out.

The Hoffa open operation seems to be followed by many relapses. Osteotomy of the femoral shaft is regarded as absurd as "there is no reason for assuming that there is a twist in the neck either to the front or back."

In none of the author's cases has a hip become re-dislocated after it had remained in the acetabulum a year after the removal of the cast unless it was subjected to severe trauma. In no case was there any evidence of a narrow or contracted socket.

Most of the ultimate failures should be credited to too early operation, lack of use during the period of retention, and neglect in replacing the hip a second or third time after a sufficient period had been allowed for shortening to take place. W. A. CLARK, M.D.

Goldthwait, J. E., and Adams, Z. B.: Congenital Hip Commission Report. *J. Orthop. Surg.*, 1921, iii, 353.

This is a partial report of the commission appointed by the American Orthopedic Association to determine the best method of reducing congenital dislocation of the hip. The commission studied the results obtained in most of the larger orthopedic clinics in the East. It also sought the opinion of every member of the Association by issuing a circular letter. It found that there is a great lack of complete records and of roentgen-ray reports and this rendered it impossible in many cases to pass judgment upon the result.

A statistical study of 713 cases was made. In 201 of these the right hip was involved; in 288, the left; and in 224, both hips. Other congenital defects, such as spina bifida, absence of the tibia, and club-foot, were found in fourteen cases, seven of which showed a good result after reduction of the hip. A special study of 102 cases was made to determine the influence of imperfections of structure on the end-results. Of these, seventy-one showed torsion of the shaft; thirteen, a shallow socket; seventeen, a poor shelf; and thirty, a fair shelf. With the exception of torsion, the effect of these defects on the end-results seemed to be slight.

In 348 cases the reduction had been effected by the Ridlon method, in 150 by the Lorenz method, in 80 with the Bradford machine, in 80 with the Hibbs table, and in 12 by open operation. The Lorenz position was used after reduction in 188 cases, the Lange position in 140, the mid-position in 7, the Schlessinger

position in 2, and the Worndorf position in 1. In some clinics the first cast remains in place for four months but in others it is changed at one month. In a few clinics the first cast remains on for eight months. Some clinics permit walking early; others, not until the cast is left off.

In order to tabulate the end-results, the cases are divided into two groups: those of patients over 6 years old and those of patients under 6. There were 156 cases in the former group, in fourteen of which the dislocation was bilateral. As an end-result after three years, fifty-four of these were found to be in; sixty, out; thirteen, marginal or anterior; and six, questionable. The second group included 414 cases in 117 of which the dislocation was bilateral. Therefore 521 hips were treated. Of these, 320 were in, ninety-three were out, fifty-one marginal or anterior, and two questionable. The proportion of successful results in patients over 6 years of age thus appears to be 26.8 per cent, while for those under 6 it is 60.1 per cent.

The authors compare these results with those reported by Papin of Bordeaux. In this clinic 725 hips were reduced by the simple manual method of Denuce. Only eleven of these came out again, and of these re-dislocations nine were put back.

W. A. CLARK, M.D.

Mouchet, A., and Durand, J.: The Operative Treatment of Complete and Irreducible Congenital Luxation of the Patella (Traitement opératoire de la luxation congénitale complète et irréductible de la rotule). *J. de chir.*, 1921, xviii, 225.

The authors cite a case of bilateral, complete, and irreducible congenital luxation of the patella. The patient, aged 10 years, walked with difficulty and although able to ascend the stairs, was unable to descend without falling. The patellæ were luxated externally and the atrophy of the patellar tendons and the quadriceps muscles was very pronounced. In other respects the physical examination was negative except for a positive Wassermann reaction.

The operative technique employed, a modification of that first devised by Roux, consisted of four steps:

1. A semilunar incision with its concavity upward was made over the site of the luxated patella so that it extended 4 or 5 cm. further upward on the side of the luxation.

2. The anterior tuberosity of the tibia was detached and the patellar and quadriceps tendons were freed. The tibial tubercle, tendon, and patella were then drawn through a buttonhole incision in the anterior portion of the capsule of the knee.

3. The tibial tubercle was secured to the anterior surface of the tibia by a small screw.

4. The lateral margins of the patellar tendon were sutured to the edges of their new bed.

Following the operation the leg was immobilized in extension for six weeks. Postoperative treatment

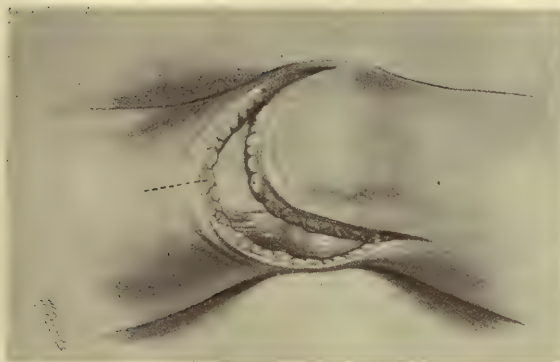


Fig. 1. Complete congenital luxation of the patella (left side). Curved cutaneous incision with concavity upward extending higher on the external side. Dotted line indicates the vertical incision to be made from the summit of the curved incision to expose the anterior tuberosity of the tibia.

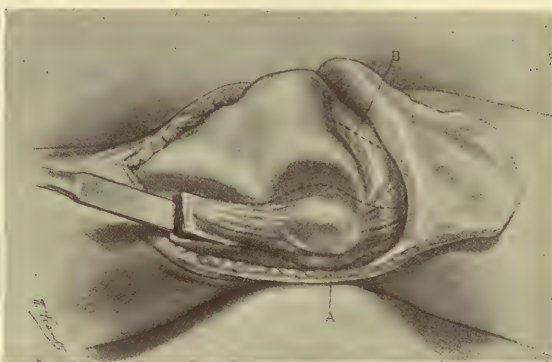


Fig. 2. The anterior tuberosity of the tibia is detached with the chisel and the patellar ligament and its folds and the tendon of the quadriceps muscle are detached by two lateral incisions (dotted lines) to above the base of the knee. B, the incision of the anterior fibrous sheath which overlaps the femoral condyles.

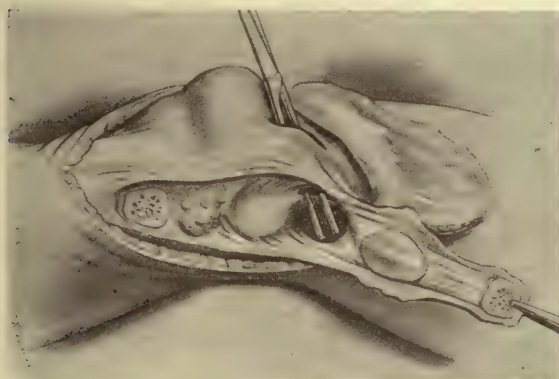


Fig. 3. Through a buttonhole incision the freed patellar tissues are seized with the forceps.

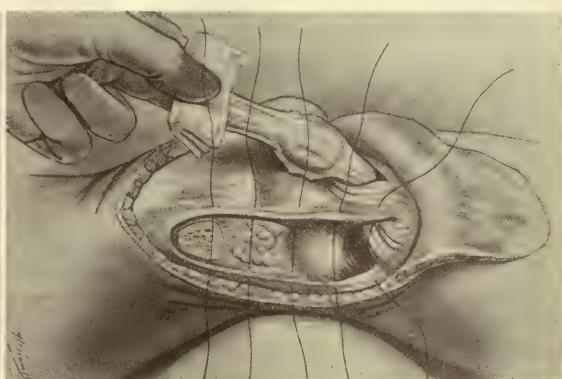


Fig. 4. The surgeon has pulled the patellar structures through the buttonhole incision. The edges of the opening in the external capsule of the knee are re-united by interrupted sutures.

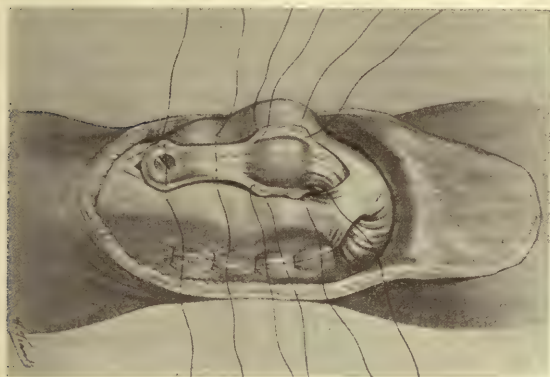


Fig. 5. Interrupted sutures fixing the patellar structures in their new position.

consisted in massage, hot water baths, and passive motion which gradually led to active movement at the end of two months. LOYAL E. DAVIS, M.D.

Rosenburg, A.: Fracture of the Scaphoid Bone of the Foot (Ueber einen Fall von isolierter Kahnbeinfraktur des Fusses). *Deutsche Ztschr. f. Chir.*, 1921, clxiv, 394.

Following a discussion of cases of fracture of the scaphoid bone of the foot reported in the literature, Rosenburg states that the mechanical force producing the fracture is in all cases the same, namely, a fall from a height, an endeavor to lessen the force by plantar flexion, an attempt to alight on the toes, and a falling backward which compresses the scaphoid bone between the cuneiform and the head of the talus. He reports a case in which, after the diagnosis was confirmed by X-ray examination, the

treatment consisted of bandaging, standing on the feet in spite of the pain, massage, and the application of heat. This treatment is recommended in preference to the nailing proposed by Goebel and the extirpation suggested by Quénu. **PLENZ (Z).**

SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

Hesse, E.: Free Tenoplasty in Tendon Defects Following Tendovaginitis (Zur Frage der freien Sehnenplastik bei Sehnendefekten nach eitriger Tendovaginitis). *Verhandl. d. Wiss. Ver. d. Aerzte d. staedt. Obuchow-Krankenhauses, Petrograd, 1920.*

The author's report is based on ten cases of his own. Little attention has been given heretofore to tenoplasty after tendovaginitis as the results of attempts along this line have not been very encouraging. Of the author's ten cases, tendons of the foot were involved in two and tendons of the hand in eight. In five cases the plastic operations were performed on the extensors, and in the five others on the flexors. In nine cases there was healing by first intention and in one case suppuration. The functional results were no improvement in two cases (the single case of suppuration was one of these), improvement in six cases, and complete restoration of tendon function in two cases.

Operation should be performed as late as possible after healing of the suppurative wound, in any case not before six to ten weeks. If it is done earlier, it may cause a flareup of a latent infection. To prevent atrophy, massage should be employed during the period of waiting. In all of the author's cases free strips of fascia lata were used as transplants. Heteroplasty is contra-indicated. Es-march's bloodless field is not recommended because of the danger of secondary hæmorrhage and adhesions and the possibility of compression of the radial nerve in the upper arm on account of the long duration of such an operation.

The incision should be made at some distance from the tendon to be repaired. Rigid scars of the skin must first be replaced by means of bridge flaps. The free fascia removed is rolled up like a tube and into its ends the freely prepared tendon stumps are sutured. The freely transplanted tendon must be placed under moderate tension. Movement and massage should be begun from the eighth to the tenth day.

The functional results are not yet satisfactory. The technique must be improved. Apparently there are renewed adhesions of the freely transplanted tendon to the neighboring tissues. Further improvement must aim at the avoidance of such adhesions.

The author reports two cases in detail. In one, four entirely destroyed flexor tendons in the hand, each 15 cm. long, were repaired. Healing occurred by primary intention and the functional result was good. While function is not perfect, the patient has almost complete ability for work. In the other

case three entirely destroyed flexor tendons in the hand, 13 cm. in length, were repaired. Healing occurred by primary intention. There is slight improvement of function. **HESSE (Z).**

Schreiber, F.: Repair of a Defect in the Quadriceps Muscle by Muscle Displacement (Ueber Ersatz eines Defektes im Quadriceps durch Muskelverlagerung). *Beitr. z. klin. Chir.*, 1921, cxxiii, 480.

The author describes the repair of a large defect in the quadriceps muscle in a wounded soldier by the displacement of the sartorius muscle. The operation was carried out in two stages. In the first operation the sartorius muscle was exposed in its central portion, cut through, and implanted in the manner of a plug in a longitudinal incision made in the anterior surface of the rectus muscle.

In the second operation—six weeks later—the sartorius muscle was exposed entirely, drawn down by its tendon insertion, and sutured to the upper ligament of the patella. To obtain closer union, a flap of periosteum in the shape of a band was separated from the anterior surface of the patella and sutured over the sartorius like a cap. Ten weeks after the operation active extension of the knee was perfect.

HORMEIER (Z).

Delagenière, H.: Repair of Loss of Bony Substance and Reconstruction of Bones by Osteoperiosteal Grafts Taken from the Tibia (With 118 New Personal Cases). *Am. J. Surg.*, 1921, xxxv, 281.

The author gives due credit for the first periosteal bone graft to Ollier who performed the operation in 1835. This first operation was unsuccessful because of suppuration. Delagenière operated upon his first case in 1905. He states that his procedure is indicated in very many conditions, including skull defects, loss of bone in the face, loss of the mandible, pseudarthrosis with or without loss of bony substance, and flail joints resulting from too excessive resection of bone.

The graft consists of a layer of periosteum to the under surface of which is attached a thin layer of bone. The bony layer is essential to give consistency to the graft and to keep the periosteum stretched and in its physiological condition to perform its osteogenetic function. The graft should have the thickness of a dime. It must never consist of the entire thickness of the internal surface of the tibia.

To obtain the graft the only instruments necessary are a chisel and a mallet. The internal surface of the tibia is exposed by a longitudinal incision, care being taken not to injure the periosteum. On this internal surface the outlines of the grafts are traced, one under the other, by means of a scalpel. In this way, one, two, or three grafts 5, 6, or 12 cm. in length are outlined, all the inner surface of the bone being utilized if necessary. When all the grafts are traced, the chisel follows these lines, penetrating into the bone. The chisel is inclined obliquely nearly parallel to the internal surface of the tibia and the osteo-

periosteal layer is removed exactly as a carpenter removes a wooden chip. When removed, the grafts resemble thick chips of wood. They are rolled up on their periosteal surfaces and are elastic enough to be bent, curved, or modelled according to the position in which it is desired to place them. They are placed in the wound where a bed has been prepared for them and are carried thereto on a sterile compress.

In order to obtain good results certain rules must be followed: The graft must be in contact with living tissue; all scar tissue should therefore be removed. Antiseptics must not be used. There should be no dead spaces where blood might accumulate and form a hæmatoma which is a fertile source of infection. Hæmorrhage must be as complete as possible. The grafts should be covered with a thick layer of tissue well sutured with catgut. A retention apparatus is necessary.

Delagenière describes his technique as modified for cranioplasties and for cases of pseudarthrosis of the mandible with loss of bone, pseudarthrosis with loss of substance in long bones, bony cavities, defects of the bones of the face, and other conditions. He details the results of a series of 118 cases. He has performed 272 operations with very good results.

PHILIP LEWIN, M.D.

Hildebrand, O.: Arthritis Deformans of the Large Joints and Its Operative Treatment (Die Arthritis deformans der grossen Gelenke und ihre operative Behandlung.) *Berl. klin. Wchnschr.*, 1921, lviii, 469.

Although it has not yet been found possible to overcome the etiological causes of arthritis deformans, there has been decided progress in the lessening of the pain and the removal of the resulting disabilities. For this there are two operative methods, resection and remodelling. Hildebrand has had a large number of good results from both. The choice of the procedure to be employed depends upon the particular joint involved, its action capacity, the degree of evolution of the process, and the location of the obstruction to movement.

With resection the best results are obtained in the metatarsophalangeal and knee joints. In the hip joint the results are good if the head of the femur is sawed off close to the neck and the neck is shaped in such a manner that it is freed from bony growths, fits into the cavity, and finds good pelvic support. However, if the changes due to the disease are not too advanced the operative results obtained from remodelling of the joint are much to be preferred. The joint motion is preserved and there is no shortening and no pain on movement.

Hildebrand performed fifteen remodelling operations on the hip and five on the knee joint with satisfactory results. After exposure of the joint, excrescences, fibrous cartilage, free bodies, capsular thickening, and other growths are removed, abnormal joint ends are remodelled, and the joint is primarily closed.

After recovery, exercises are instituted. These must be conducted with caution and may require a long time. The permanent results differ because they depend a great deal upon the patient's energy. However, in all of Hildebrand's cases there was decided improvement which has continued for many years. Hildebrand has operated also with favorable results once on the shoulder and once on the elbow joint.

DRAUDT (Z).

MacAusland, W. R.: Mobilization of the Elbow by Free Fascia Transplantation; with Report of Thirty-One Cases. *Surg., Gynec. & Obst.*, 1921, xxxiii, 223.

In 1914 the author reported before the Orthopedic Section of the American Medical Association four cases in which he gained mobility in ankylosed elbow joints by means of arthroplasty. In two of these he used the Murphy method, interposing pedunculated flaps of fat and fascia, and in two he employed free flaps of fascia lata.

Ankylosis of the elbow results either from an infectious process or traumatism, the latter as a rule a fracture with wide separation. The large amount of callus which forms as a result of injury at first interferes with motion mechanically; ankylosis, which is usually fibrous in character, develops later. The process of infection may be chronic. The causative agencies are usually a streptococcus, pneumococcus, or the gonococcus.

In the elbow joint the conditions are different from those in any of the larger joints. In the lower extremities stability is far more important than motion. Here, particularly in the knee, a firm painless joint in good position is far more useful than a weak joint continuously subject to strains and wrenches. In a shoulder ankylosed in an abducted position a useful degree of motion may be had through the resulting hypermobility of the scapula. A stiff wrist in a good position, i.e., hyperextension, is serviceable. This joint does not lend itself readily to arthroplasty. In the elbow, no position of ankylosis is favorable to function and any position is ungainly.

Many methods have been tried to obtain mobility in the elbow. Various non-absorbable materials have been employed. Murphy, in 1901, first used the fascia method on a knee joint. A large layer of fascia lata with a thin layer of muscle tissue attached was dissected from the outer surface of the vastus externus with its base below and anterior. A small flap of fascia covering the vastus internus was dissected free and placed between the patella and the femur. Murphy first mobilized the elbow by this method in 1904 in a case of ankylosing arthritis. A pyriform flap of deep fascia was dissected from the posterior surface of the triceps. This flap was $4\frac{1}{2}$ in. long by 2 in. wide at its upper end and received its blood supply from a broad pedicle which was left attached to the muscle and fascia below the level of the olecranon. After the bony parts had been remodeled the fascia was drawn down and turned

into the joint around the inner margin of the olecranon. The proximal portion of the flap covered the trochlea and lined the olecranon depression and lesser sigmoid cavity, while the distal portion covered the external condyle. Five months later, pronation and supination were about one-half normal. Payr in 1914 reported a case about four years old which emphasizes the importance of removing the capsule, at least the synovialis, as well as the fibrous cartilage.

Payr has never observed a secondary dislocation or a loose joint except in some of his first knee cases. He advises waiting at least six months if re-operation is necessary. He believes that if all indications are correct and the technique and after-treatment are good, a favorable result is to be expected in 70 to 80 per cent of the cases.

Steindler found in experiments on a small number of dogs that no adhesions were formed after scraping the cartilage covering either with the insertion of fascia or in controls. Pedunculated flaps of muscle fascia were transformed with a connective tissue pannus adherent to the denuded areas of the bone. The denuded areas showed lacunar re-formation of cartilage but no re-formation of bone.

The author states that mobilization should not be attempted until epiphyseal growth has ceased. Before this, it is impossible to remove sufficient bone to secure good motion without grave danger of injuring the epiphyseal line; ankylosis is almost sure to result. When the joint has been the seat of an infectious process, arthroplasty should not be done until all signs of its activity have disappeared. The operation should not be deferred too long, however, as convalescence is lengthened when atrophy of the soft parts from disuse is marked. The exception to this rule is the tuberculous joint. In this condition the advisability of arthroplasty is very doubtful. If done at all, it should be performed very late, a number of years after all acute symptoms have subsided. Even then, there is danger of lighting up a quiescent process.

In this article the author cites twenty-eight cases treated by arthroplasty of the elbow joint. He uses the following operative technique:

The arm from the wrist to the shoulder and the leg on the same side from the hip to the knee are given a two-day preparation. At the time of the operation a tourniquet is applied to the upper third of the arm and iodine is applied to the skin. A semicircular incision is then made, beginning over the external condyle and running down about 2 in. and up over the internal condyle. The wound is sponged with alcohol and carefully clamped off to avoid handling the skin during the operation. The flap containing skin and superficial fascia is then dissected back to the base line and retracted. The ulnar nerve is isolated and dissected out of its sheath. At times it is very difficult to find this nerve but it is always to be sought at the inner side of the internal condyle. It is dissected out carefully with a blunt dissector so as not to break or injure

it. After it has been freed for $1\frac{1}{2}$ in. gauze is passed beneath it and it is retracted to the ulnar side. It is then freed further by blunt dissection and gauze.

A transverse incision is then made extending down through the periosteum and following in direction the superficial one, outlining a flap which is to be dissected back and preserved *in toto* to cover the joint. The pulling back of this flap is a difficult and tedious process but when well started it can be effected readily by blunt dissection. The chief difficulty is experienced on the inner side as here the layer is thin and there is danger of penetrating it. The olecranon having been sawed through, it is frequently possible to break open the old joint. In some cases, however, the ankylosis is bony and the joint must be sawed through. The tip of the olecranon is chiseled out and dissected back with its posterior flap.

The capsule, fascia, and ligaments are then dissected back so as to allow the lower end of the humerus to protrude into the wound when its edges are snipped off with rougeur forceps and a new trochlear or intracondylar surface is formed. A shoemaker's rasp is used in filing the extremity as near like the end of the normal humerus as possible. After this modelling, a piece is removed corresponding to the olecranon fossa in the normal humerus. Care is necessary in making this cup as the success of the operation depends largely upon attention to such details. The modeling is done largely with a saw and file.

To insure good function the joint surface must fit accurately before the fascia is applied, but the joint must not be too loose. Only sufficient bone should be removed to give free function. If too much is removed a flail-joint will result, giving the operation no advantage over an excision. When the mortising is completed the fascial flap is dissected from the leg. An incision extending down to the fascia lata is made on the outer side of the thigh a little below the middle. After a flap of fascia 5 to 7 in. long by 4 to 5 in. wide is dissected out, the wound is closed.

The fascia, which is free from all fat, is placed about the newly fashioned humeral condyles and attached anteriorly to the capsule and posteriorly to the periosteum of the lower end of the shaft of the humerus with interrupted sutures of chromic catgut No. 2. Chromic catgut No. 2 is then wound twice loosely around the shaft just below the interrupted suture line.

The forearm is placed in opposition to the condyles. Two drill holes are then made in the olecranon process and two others opposite them in the shaft of the ulna. Through these, kangaroo tendon is passed and tied. The inner layer is then sutured with chromic catgut No. 2 and the skin and fascia with plain catgut No. 2. Dry sterile dressings are applied and the arm put up in plaster beyond a right angle.

If there is no evidence of infection following the operation the cast is left in place for a week. It is

then split and the dressing changed. If there is a persistent temperature, a window is cut in the cast and the wound inspected.

Passive motion is begun in about ten days if normal healing has taken place. After normal healing, the arm is kept at about a right angle. After three weeks, gentle massage is applied. Baking three or four times a week is begun in six weeks.

The ultimate success in these cases depends very largely on the after-treatment. The patient should be kept under observation for a long period of time. Frequent X-ray examinations should be made to follow the bony changes in the joint. If motion begins to decrease, the arm should be manipulated under an anæsthetic and the elbow put up in acute flexion. Occasionally motion becomes limited by exuberant growth of new bone. A secondary operation is then necessary to remove the obstruction, but should not be undertaken for at least three months after the first operation.

S. C. WOLDENBERG, M.D.

Von Dittrich, K.: Flail Joint of the Elbow with Extensive Bone Defect and the Goetze Operative Treatment (Schlottergelenke des Ellbogens mit grossem Knochendefekt und ihre operative Behandlung nach der von Goetze angegebenen Methode). *Deutsche Ztschr. f. Chir.*, 1921, cxiv, 315.

The Goetze method of treating flail joint of the elbow is recognized as the simplest and most efficient procedure when there is a considerable bone defect. Separation of the lower arm extensors and flexors and of the skin is effective. After a short time the free working muscles become so strengthened that thoroughly satisfactory function of the joint is obtained by the use of the Goetze apparatus. Besides three flail joints of the elbow, one of the wrist was operated on in a similar manner. By the use of a complicated supporting apparatus, flexion and extension as well as pronation and supination were made possible. BONN (Z).

Kaufmann, C.: The Technique of Tendon Suture in the Hand and Finger (Die Technik der Sehnennaht der Hand und Finger). *Schweiz. med. Wchnschr.*, 1921, li, 601.

The author agrees in general with the view of Dubs that as a rule the results of tendon suture are only fair. He classes as worthless half of the primary sutures of extensor tendons, nine-tenths of the primary sutures of flexor tendons, three-fourths of the secondary sutures of extensor tendons, and all secondary sutures of flexor tendons. He attributes these poor results to lack of skill and improper methods and after-treatment.

Kaufmann himself obtains very good results. He makes the suture always according to the Woelffler method, using a single suture. On the fingers one should make only transverse cutaneous incisions unless it is necessary to widen them by a long incision along the side of the finger. The tendon sheath should not be opened any further than necessary. If a tendon

has retracted considerably it is advisable to search for its end through a new incision and then draw it down through the sheath. The skin suture should not come in the same region as the tendon suture. Extension dressings are of special importance. These should remain in position for at least two and one-half weeks.

Many of the unfavorable results following primary healing of the wound are due to too early traction on the tendon. In extensor tendons the main hindrance to good function is a adhesion to the skin. If a tendon suture does not hold, the tendon sheath generally becomes obliterated as far as the tendon end, disappears in the scar tissues, or becomes a solid band.

The author gives a few illustrative histories. In conclusion he states that tendon suture should be attempted only by skilled surgeons.

VON TAPPEINER (Z).

Smith-Petersen, M. N.: Arthrodesis of the Sacro-Iliac Joint: A New Method of Approach. *J. Orthop. Surg.*, 1921, iii, 400.

The author states that up to the present time operative treatment on the sacro-iliac joint has been decidedly unsatisfactory. This is due to the fact that the joint is deeply located in a region which excludes any approach from anterior and superior aspects. Of the two remaining approaches, the posterior and the lateral, the former offers many difficulties. The lateral approach seems to be the most logical and yet in the literature there is no article or reference describing or recommending this route.

During the last three years a lateral method of approach has been used in a number of cases with great satisfaction as regards both the actual operative procedure and the results obtained. This method, the subperiosteal approach, is described as follows:

1. A curved incision is made from the posterior superior spine along the crest of the ilium two-thirds of the distance to the anterior superior spine. This incision having been carried down to the bone, the reflection of the periosteum is begun.

2. An incision is made from the posterior superior spine in the direction of the fibers of the gluteus maximus for a distance of 3 or 4 in. This incision is carried down through the subcutaneous fat and gluteal fascia and the muscle fibers of the gluteus maximus are separated by blunt dissection until the juncture of the ilium and sacrum between the posterior superior and posterior inferior spines is reached. The superior gluteal nerve and artery must be sacrificed in the dissection in order to obtain a satisfactory reflection.

3. The flap thus outlined is reflected subperiosteally to expose the posterior portion of the lateral surface of the ilium.

4. A window is cut through the ilium within the projected area of the joint, the inferior border of which corresponds to the sacro-iliac notch and the anterior border to the median gluteal line. The window may be rectangular in shape. The removal of the window offers a splendid view of the cartilagin-

ous joint surface of the sacrum. The cartilage is next removed with the cortex, bringing about good exposure of cancellous bone.

5. The cartilage and cortex are removed from the excised bone and the latter is replaced in its original site so that its cancellous surface will be in contact with the cancellous bone of the sacrum.

6. The flap is returned to its place and the periosteum and soft parts are sutured in layers.

The position of the window should be varied according to the requirements of the particular case. In purulent infections the window is cut in a direction parallel to the sacro-sciatic notch; in cases of tuberculosis it is cut at an angle.

The author has used this method in seven cases of tuberculosis of the sacro-iliac joint and six cases of relaxation of the sacro-iliac joint with uniformly successful results.

LIONEL D. PRINCE, M.D.

Schanz, A.: Treatment of Genu Varum (Zur Behandlung des Genu varum). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 776.

Schanz distinguishes two forms of genu varum in adults, one with a rather localized bend between the head and shaft of the tibia and the other a more marked form in which there is a general bending out of the entire leg. In the first type an osteotomy on the medial side of the tibia suffices if the fibula is left intact. To prevent injury to the knee joint by abnormal pressure and traction, a nail or rod is driven into the head of the tibia and the free projecting end is used as a point of traction for the plaster of Paris dressing. After ten to fourteen days the nail is removed.

In the second form two or three osteotomies on the extension table are necessary in each leg, first in the middle of the femur. Beforehand a nail of non-rusting steel is screwed into the cortex of the bone both above and below the osteotomy to be used as a traction and fixation point in the application of the plaster cast. After about fourteen days the screws are removed. In the third week, the second osteotomy is performed as a rule below the head of the tibia. In severe cases a third osteotomy is done at the juncture of the middle and lower thirds of the tibia. The proper relation between the two legs is maintained by binding them together in a cast, the "mummy cast." If the fibula is not bent it has a tendency to cause a recurrence of the deformity because of its elasticity, especially if the tibial osteotomy was done near the ankle.

GRASHEY (Z).

Pascalis, G.: The Evolution of Knee Resection (Note sur l'évolution de la resection du genou). *Presse méd.*, Par., 1921, xxix, 681.

The author has had the opportunity to examine a very large number of patients who had undergone a knee resection. In some of the cases there was non-union, and in a great many a faulty attitude. The defect of non-union Pascalis believes is due to operating upon the patient when he is not in a good general

condition or to a fault in the operative technique, the bony contact being poor because of defective section or faulty immobilization which permits the formation of a secondary fibrous deposit between the bone surfaces. In many such cases a secondary operation is successful. Faulty attitude following knee resection is to be traced to overriding of the fragments at the time of fixation by a retention apparatus and to the action of the muscles.

Correct section and consolidation of the fragments are essential. Because of the preponderating action of the biceps in displacing the tibia, it seems legitimate to section its lower tendons.

The author draws attention to the necessity of using a second immobilizing apparatus after the first plaster cast has been removed. For this new casing he prefers silicate of potash to plaster of Paris. The silicate is elastic, may be used to give support in walking, and takes the place of celluloid. In addition to being easily removable, it allows massage of the limbs, baths, and exposure to the air. The author is now studying the details of an apparatus which will permit the patient to walk early and will leave the injured limb exposed to the air.

W. A. BRENNAN.

Gaudlitz, G.: A New Modification of Exarticulation Below the Astragalus: Malgaigne (Ueber eine neue Modifikation der Exarticulatio sub talo: Malgaigne). *Deutsche Ztschr. f. Chir.*, 1921, cxliii, 284.

Gaudlitz prefers the Malgaigne operation to that of Pirogoff and Squel because it gives a longer stump, an elastic step, and uses sole-skin as a covering for the stump. Its disadvantages are the pathologic plantar flexion of the talus, which may cause difficulties. This may be avoided, however, by following Koelliker's suggestion to leave the scaphoid bone attached to the talus. The head of the talus then remains in its physiological position and a stump of greater carrying surface and greater elasticity is obtained. In this operation the skin flap must be made sufficiently large and care must be taken not to injure the talo-navicular joint.

STAMMLER (Z).

ORTHOPEDICS IN GENERAL

Jones, R.: Manipulation of Stiff Joints. *J. Orthop. Surg.*, 1921, iii, 385.

If a painful joint is rigid in all directions, arthritis is present, but if it is rigid only in certain directions it is free from arthritis if its movement in the other directions is normal.

Intra-articular adhesions may be due to rupture of the joint capsule, hæmorrhage, or plication of the synovial membrane with adhesion.

THE PREVENTION OF ADHESIONS

Following direct injury to a joint which does not cause fracture, movement should be begun immediately after the cessation of the acute symptoms, i. e., when the swelling and tension pain have disappeared. In children passive movements may be begun before active movements in each anatomical direction.

BREAKING DOWN OF ADHESIONS

Light adhesions may be broken down under gas, or gas and oxygen anaesthesia. Complete anaesthesia to obtain complete relaxation of the muscle is necessary if the adhesions are strong and resistant. The joints should be moved through the full anatomical range. If firm and resisting, the movements should be less complete, and full mobility should be secured by stages. The limb should then be held in the position of full correction until the patient is able to make a voluntary effort. Movements should be begun as soon after manipulation as possible, depending upon the severity of treatment and the reaction. The corresponding limb should be used as a guide to determine the range of motion. If the range of motion is diminished after manipulation the after-treatment has been defective or the manipulation ill-advised.

A fracture present near a joint should be adequately protected from strain by means of closely applied splints before manipulation is begun. The presence of effusion in a joint after manipulation is strongly suggestive of the rupture of intra-articular adhesions, but this has no ill-effects unless the effusion is accompanied or followed by a decrease in the range of movement. In such case the joint requires rest. The rupture of typical adhesions is audible and may be felt under the hand, but if the resistance is overcome by gradual stretching the prognosis is not so favorable. The joint should be kept in its new and corrected position at rest for a few days and gentle passive movements then begun. Pain which is sharp and of short duration is negligible, but if it continues, increased stiffness is apt to follow and rest is necessary.

FORCED MANIPULATION

The shoulder. In forcible manipulation of the shoulder the patient lies on his back and the assistant places his fist in the axilla to protect the head of the humerus from displacement or fracture. After fixation of the shoulder girdle the arm is abducted to a right angle and the patient's hand then placed behind his head with the joint pressed backward. The shoulder is then rotated inward with the forearm placed behind the back and the forearms are brought forward fully extended and supinated. Next, the shoulder is circumducted with the palm of the hand behind the occiput. In this position the patient should awaken.

Subacute arthritis of the shoulder is usually due to stubbing of the joint and, particularly in old persons, is often associated with Colles' fracture. The symptoms are rigidity in all directions, pain on pressure over the joint just external to the coracoid, and inability to lie upon the shoulder.

The elbow. In cases of light adhesions not associated with joint injury complete flexion and extension with the forearm first in complete pronation and then in supination are all that is necessary. To break down firm adhesions with marked limitation of motion in cases of usually old fractures, first extend in supination and then flex to the safety point, fixing the arm by means of a sling for a few days. Then fix the

forearm in extension for two days. Active and gentle passive movement should then be attempted.

If an elbow joint becomes more stiff and painless during passive movements, traumatic myositis ossificans associated with a fracture or dislocation should be suspected, and the coronoid process may be torn away.

Wrist. The wrist should be dorsiflexed, palmar flexed, and moved laterally. This should be followed by circumduction and immediate active movements. If dorsiflexion has been difficult the hand may be fixed in this position for a few days. For limited and rigid palmar flexion the hand should be fixed in a corrected position for twenty-four hours and active movements then begun. Adhesions of the midcarpal and postcarpal joints following fracture or dislocation should be manipulated as soon as possible to secure free mobility of the wrist. If motion is limited after an attempt to reduce a fracture or displacement of the scaphoid or semilunar, the bone should be removed. A good result may be expected. Delay causes impairment of function in the wrist. In manipulating the fingers, the wrist should be dorsiflexed and extension should always be employed during adduction and abduction. The fingers should be slightly bent for rotation.

Hip. Manipulation of the hip joint for pain and stiffness associated with non-articular hypertrophic osteoarthritis gives relief lasting for two or three years. The full range of motion should never be attempted. With the patient on his back, the limbs should be fully extended, then rotated inward and outward, and then crossed in adduction. This should be followed by flexion of the knees to a right angle and abduction of the thighs. Full flexion at the hips should be followed by abduction, rotation, and circumduction.

Knee. Cases of adhesions about the insertions of the ligamentum patellæ are characterized by a few degrees of motion from full extension, swelling about the lower parts of the ligament, and slight oedema. Rapid manipulation is followed by complete recovery.

Injury to the internal lateral ligament is followed by pain and limitation to complete extension. Function of the joint is restored by manipulation and immediate exercise.

Adhesions between the internal lateral ligament or capsule and the internal meniscus or coronary ligaments due to injury cause slight pain on walking, especially over rough ground, and on pressure over the ligament. Manipulation with the knee flexed to 90 degrees and rotated inward and outward is at once beneficial.

A knee with fixed patella or with quadriceps adherent to the femur should never be flexed. If adhesions are firm, turn the patient on his face so that the front of the thigh rests on the table and the joint may be flexed and rotated with both hands.

Foot. In cases of pain over the dorsum of the foot and along the plantar fascia, or on passive manipulation, cure is obtained by breaking down the adhesions under anaesthesia.

RUDOLPH S. REICH, M.D.

SURGERY OF THE SPINAL COLUMN AND CORD

Estor, E.: The Treatment of Scoliosis (Le traitement de la scoliose). *Rev. d'orthop.*, 1921, 3 s. viii, 379.

Estor states that in the last Orthopedic Congress the reports on scoliosis indicated that Abbott's method has not given the expected results. Estor remains convinced of the superiority of the method proposed by him in 1919, viz., accentuated flexion of the trunk on the lower limbs around an axis passing through the two coxa-femoral articulations; slight flexion of the vertebral column; detorsion. In nine cases of dorsal scoliosis with the convexity toward the right side which were treated according to this method complete correction was obtained in four. The deviations ranged from $1\frac{1}{2}$ to 3 cm. and were corrected in from two months to a year. Five patients were benefited, the flexion being considerably reduced. There was no case in which some correction was not obtained.

Estor disagrees with Abbott's contention that the plaster corset should be fenestrated. To assure fixation of the thorax and yet leave sufficient space for respiratory movement, Estor places several layers of felt to the thickness of 5 cm. between the surface of the chest and the plaster. The elasticity of the felt allows respiratory movements and preserves the solidity of the cast.

Estor's method acts only on dorsal curvature, having no effect on compensatory lumbar curvature.

W. A. BRENNAN.

Vallette, A.: A Case of Vertebral Lymphogranuloma with Paralysis of the Upper Cervical Roots and Localized Adenopathy (Un cas de lymphogranulome vertébral avec paralysie radicaire cervicale supérieure et adénopathie localisée). *Rev. méd. de la Suisse Rom.*, 1921, xli, 456.

The patient was a woman 58 years of age who sought treatment on account of persistent epistaxis. Examination disclosed enlarged glands in the sub-

clavicular fossa and a pelvic tumor which proved to be a uterine fibromyoma. A diagnosis of tuberculous adenitis did not seem justified. The blood picture was characteristic of lymphogranuloma, showing a moderate secondary anæmia, a marked decrease in the lymphocytes, and an increase of polynuclear neutrophils and large mononuclears. The eosinophiles amounted to only 2 per cent. Histologic examination of an excised cervical gland led to a diagnosis of lymphogranuloma. The patient was given radiotherapy.

Subsequently paralysis of the right upper limb developed which prevented elevation of the shoulder and flexion of the forearm. Further clinical and X-ray examinations revealed a lesion in the vicinity of the fifth cervical vertebra. Fever, tachycardia, and rapid respiration developed and the patient died.

At autopsy the anatomical findings were: lymphogranuloma of the glands of the neck with induration of the mediastinal tissue; cavitory spondylitis of the fifth cervical vertebra which affected the roots; beginning meningitis with slight internal hydrocephalus; goiter; slight dilatation of the heart; hyperæmia and edema of the lungs; a small white area in the left kidney; and large myomata of the uterus. Histologic examination of the cervical glands verified the findings made in the excised specimen. Macroscopic examination showed a tortuous cavity which traversed the fifth vertebral body and contained sequestra. The lower part of the vertebra especially was destroyed and this destruction involved the intervertebral disc. Posteriorly, the lymphogranulomatous proliferation extended beyond the vertebra, and on the external surface of the dura mater was a thick layer with a typically lymphogranulomatous structure. The roots of the fifth nerve showed atrophy of the fibers.

The author states that lymphogranuloma is unusual in persons over 35 years of age.

W. A. BRENNAN.

SURGERY OF THE NERVOUS SYSTEM

Cushing, H.: The Special Field of Neurological Surgery After Another Interval. *J. Iowa State M. Soc.*, 1921, xi, 337.

The author states that what had sufficed as surgical technique for other organs and tissue was found to be disastrous when applied to the surgery of the nervous system.

A decompression over relatively "silent" portions of the brain is now done only in the temporal and suboccipital regions where muscle closure over the area can be made. Changes in the optic nerve head observable by means of the ophthalmoscope are due much more often to an increase in the tension of the cerebrospinal fluid or direct pressure exerted on the

nerve by tumors in the region of the chiasm than to any other cause.

In Cushing's opinion, the subtemporal and the suboccipital operations are, in the long run, the two most useful procedures in cranio-cerebral surgery. They have not yet been perfected, however, and there are right and wrong ways of performing them. The subtemporal decompression Cushing places first. It is employed not only as a temporizing measure in the presence of a localizable lesion, but is found of value in all unlocalizable cerebral tumors. An obstructive hydrocephalus can be determined by puncture of the temporal horn of the lateral ventricle through the subtemporal decompression opening.

The routine operation of second importance is the combined osteoplastic exploratory and decompression operation.

With the bone flap so placed that its base is in the temporal region, the squamous wing of the temporal bone may be rongeué away after the flap is reflected.

The old two-stage operations are called for less and less frequently. Whenever possible, an operation should be completed at one session.

The third procedure, the typical cerebellar exposure, is a still more difficult operation and neces-

sitates elaborate preparations and skillful teamwork if a long series of these measures is to be carried through with a minimal mortality. It is a two-hour operation at best, and in some cases it may require an extra hour or two. There is no field of surgery in which fastidiousness is more essential to success. A surgeon would be foolhardy and negligent of his patient's welfare to venture upon a succession of these more arduous and uncertain operations in a single morning.

Detailed pre-operative study is essential.

CARL R. STEINKE, M.D.

MISCELLANEOUS

CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

Melnikoff, A. W.: Fatal Contusion Caused by Artillery Projectiles. (Zur Frage der toedlichen Kontusion durch Artilleriegeschoss). *Nautschnaja Medyzina*, 1920, vi, 518.

In the first two years of the war there passed through the chief dressing station of the four regiments of the N-Division and the Artillery Brigade 2,023 men suffering from contusions, 7 per cent of all those with wounds and contusions. Of those with contusions, eleven died. In the same period 834 men with contusions passed through the First Hospital, three of whom died. This article is based on these three cases.

When they were brought to the hospital, within twelve hours of the injury, two of these patients were unconscious and without a pulse in the peripheral arteries. Death occurred two and five hours later. The third patient was received in a grave condition with loss of hearing, nearly complete loss of the power of speech, hæmoptysis, no pulse perceptible, and a temperature of 35 degrees C. Death occurred during the night. Signs of external injury were absent in all three cases. The findings at autopsy, performed twenty-four hours after death, were as follows:

Case 1. Interior of skull, no changes. Both lungs bloody, many small hæmorrhages under the pleura. In the upper lobe of the right lung, a tear in the lung tissue which was 6 cm. long and extended nearly to the apex of the lung. In the left lung, a small tear with extravasation of blood into the pleura. In the spleen, six diagonal tears extending to the hilus.

Case 2. Slight extravasation of blood into the mediastinum. The lungs hyperæmic. Slight tears in the lungs and pleura. In the abdominal cavity fluid of a dirty yellow color. At the base of the cæcum a large lacerated wound. Above this, a second wound and five partly lacerated wounds, all on the posterolateral surface of the cæcum.

Case 3. In the brain, no visible changes. In the left side, small tears in the pleura and adjacent lung tissue. In the right lung small tears in the parenchyma. In the right pleura a large extravasation of blood, about 1½ cm. long.

In all three cases injury to the lung tissue with considerable extravasation of blood into the pleural cavity was proved. In the second case there were external tears of the cæcum. In no case were changes in the brain demonstrated; if such were present, they must have been of molecular character.

The author considers also the literature of the subject. There are four possible causes of contusions: (1) physical, (2) mechanical, (3) chemical, and (4) psychic. The first three produce physical changes in the tissues, and the fourth, purely functional disturbances of the nervous system. The physical causes are determined by: (1) the movement of the air, the condensed current of which causes injury by a heavy blow; (2) the change of barometric pressure, and (3) tone-phenomena, which affect the hearing. The blow exerted by the condensed current of air may be equal to a blow with a hard object (Segaloff, Schumkoff). The mechanical cause is most often determined by the fall of the injured person to the ground or against some hard object. The chemical cause comes into play upon the bursting of the artillery projectile, particularly if it contains poisonous gas. For fatal contusion the physical and mechanical causes are chiefly responsible.

The pathogenesis in the author's cases is referable to the cause. With regard to Case 1, it is to be assumed that the air current struck the soldier on the left; hence the severe injuries of the left side. The mechanism of the lung injuries is explainable as follows: The condensed air wave compressed the thorax. At the same time the air pressure was markedly raised and this led to expansion of the lungs. The lung was finally both inflated and compressed, conditions which favored tearing of the tissues.

The mechanism of subcutaneous injury of the abdominal organs is also considered. In Case 2 the extensive injury to the cæcum is interesting. The fixed cæcum showed tears starting from its insertion and running toward the sides, similar to the tears in the spleen in Case 1. An isolated injury of the cæcum is extremely rare; Petry saw only seven such injuries among 198 intestinal wounds. In Case 3, the injury to the lung was slight, but the effusion of blood was large (1½ liters). This is to be explained by the fact that the patient survived longer.

In all these cases there were injuries to the lungs. In contusions the lungs are exposed to trauma by reason of their numerous small blood vessels which tear easily. The adhesions which are often present between pleura and lung also play a rôle. The following conclusions are drawn:

1. In contusions from artillery projectiles it is possible for severe, even fatal injuries of the internal organs to be present when there are no external injuries.
2. The most severe organic injuries in fatal contusions are found in the lungs.
3. In the fatal contusion from an artillery projectile, the contusion from the air and the contusion from falling, i. e., the physical and mechanical causes, come into consideration.
4. The great number of sufferers from contusions in the recent war is explained by the extreme intensity of the artillery fire of the warring powers.

SCHAAK (Z).

Symmers, D., and Vance, B. M.: Epitheliomata of Thymic Origin. *Arch. Int. Med.*, 1921, xxviii, 239.

The histogenesis of the thymus is still a subject of debate. Most investigators are agreed that the reticulum and Hassall's corpuscles are epithelial in origin. However, the derivation of the small cells has not been determined. Some investigators are of the opinion that early in the process of development the thymus becomes invaded by mesenchymal elements which differentiate into lymphocytes and that these accumulate in such numbers as to give to the organ the appearance of a lymphoid structure. Other investigators do not share this belief but regard these mesenchymal elements as epithelial.

The authors state that from the clinical standpoint tumors of the thymic parenchyma, both epithelial and lymphocytic, present certain features of practical interest. First, the lymphocytic tumors outnumber the epithelial by a considerable margin. Second, there are considerable variations in the matter of physical signs. Certain tumors of the thymic parenchyma give rise to noteworthy signs of pressure. These growths represent a minority, it is true, but that they exist is shown by the complete absence of pressure effects in some cases, and by the presence of a comparatively trivial complaint, namely, pain on swallowing. Others grow expansively in the upper thorax and are attended by marked signs of pressure, cough, expectoration, and dyspnoea, particularly on the right side of the chest anteriorly and the corresponding arm, due to interference with the circulation in the innominate and subclavian veins, hydrothorax, and ascites. A subdivision of this group is represented by those thymic lymphosarcomata which grow expansively for a period of months or years and suddenly terminate life with the picture of acute leukæmia, the tumor pouring lymphocytes into the circulation abruptly and in large numbers. Generally these

growths are attended by pressure symptoms. In one case, however, clinical disturbances were of only three weeks' duration although the intrathoracic tumor was of enormous size and must have been present for a much longer period than that suggested by the clinical history. Belonging to this group also are those thymic lymphosarcomata which exhibit an extraordinary tendency to bring about symmetrical and diffuse lymphocytic infiltration and massive enlargement of the kidneys without, however, producing other than slight disturbances of the renal function. These tumors are usually attended by symptoms of intrathoracic pressure, although in some cases of thymic lymphosarcomata clinical symptoms were present for only two or three weeks and the primary tumors were found at autopsy to be of such large size that their origin must have antedated the onset of the symptoms by many months.

From these facts it is apparent that primary thymic tumors, whether of the lymphocytic or epithelial type, are inconstant in producing signs of intrathoracic pressure, and primary tumors of the thymus may give rise to comparatively mild signs of intrathoracic compression, but by metastasis may produce marked destruction in adjacent extrathoracic tissues.

From the standpoint of malignancy it is important to observe that the lymphosarcomata and epitheliomata of the thymus gland do not differ essentially from tumors of the same sort occurring in other parts of the body.

The epitheliomata of the skin and mucocutaneous junctions commonly exhibit a tendency to remain localized—that is to say, to infiltrate neighboring tissues rather than to metastasize to distant parts. That they do at times become widely disseminated is not, of course, to be denied, but in these circumstances metastasis is apt to occur as a late event.

These facts are of moment as applied to the lymphosarcomata and epitheliomata of the thymus gland, the knowledge of which is based exclusively on evidence obtained from the completion of neoplastic growth as revealed by examination of the body after death.

In conclusion, the authors state that as attention becomes more and more focused on the early diagnosis of tumors of the thymus gland, it is not too much to hope, perhaps, that at least some of these growths may be discovered before neighboring tissues have been irreparably damaged. The preponderance of lymphoid growths of the thymus and the known effects of radiation on lymphocytic tissues suggest that the use of the roentgen ray might be beneficial in the treatment of tumors of this type. It is conceivable also that greater attention to the interpretation of symptoms of pressure in the anterior mediastinum and the use of such diagnostic aids as the roentgen ray might sometimes lead to the detection of thymic tumors sufficiently early to permit their enucleation before they have progressed too far. GEORGE E. BEILBY, M.D.

BLOOD AND LYMPH VESSELS

Moller, P.: An Intracranial Aneurism of the Carotid Artery (Ueber ein intrakraniales Aneurysma der Carotis). *Hosp.-Tid.*, 1921, lxiv, 305.

A 58-year-old woman noticed eight years previously slight drawing pains in and about the region of the left eye. Not long afterward her vision became affected, objects appearing blurred. The eyelid gradually began to droop. The pains became progressively more severe and the eye immobile with its axis directed upward and nasalward. The patient had suffered for several years with shortness of breath on exertion and sometimes with marked swelling of the limbs.

There was no pain in the precordium. Hissing or ringing sounds in the head were never noticed. For many years she had had gastric catarrh and marked constipation. Her family history was negative. Two days before she entered the hospital she experienced sudden severe pains radiating especially toward the brow, the left cheek, and the left ear. These were associated with vomiting and complete ptosis of the left eyelid.

At the time of examination the patient was rather cyanotic. Her temperature was 100.4 degrees, and her pulse 80, slightly irregular but strong. The exit point of the left supra- and infra-orbital nerves was sensitive to pressure. The left eye, which was surrounded by marked hyperæmia, was held shut. The conjunctiva was cyanotic, the tension was normal, the cornea was clear, and the pupils were equal, but the left pupil was reactionless. There was no pulsation of the orbit. The ophthalmoscopic examination showed paralysis of all the eye muscles and marked decrease in vision. Nothing abnormal was noted in the eye background. Over the apex of the heart a systolic murmur was audible. The second pulmonic tone was accentuated. The urine showed albumin and casts. The Wassermann test was negative.

The temperature rose rapidly to 103 degrees and, without the development of any new symptoms, death occurred suddenly the fourth day after the patient's admission to the hospital.

The postmortem examination revealed chronic fibrous endometritis, sclerosis of the aorta, pleurisy, fibrous peritonitis, a gastric cicatrix, cirrhosis of the liver, chronic nephritis, bilateral chronic salpingitis. Slight flattening of the gyri was noted but otherwise the brain was normal. Under the left temporal lobe a slight hæmorrhage in the subarachnoid space was found. Close to the body of the sphenoid bone on the left side was an oval, very soft, dark red tumor, the size of a walnut, which extended inward and could be easily separated from the surface of the brain except on its posterior end where the dura and brain were penetrated by a clot as thick as the finger. This clot extended from the surface of the tumor to the temporal portion of the left ventricle. The right and left lateral ventricles as well as the third ventricle were filled with blood coagulum. The tumor reached to

the orbit, terminating at the upper orbital fissure adjacent to the optic nerve. The left cavernous sinus had disappeared. The third, fourth, fifth, and sixth cervical nerves were completely obliterated and could not be isolated. The gasserian ganglion was flattened almost beyond recognition. The tumor extended both proximally and distally into the internal carotid, it being a sacciform aneurism in the region of the cavernous sinus.

The author states that an anatomical picture such as this is very rare, as has been indicated by the work of Moeller. According to Moeller, syphilis, arteriosclerosis, and trauma must be considered in the etiology. In traumatic aneurisms there is practically always an arteriovenous communication.

In the case reported by the author trauma could not be verified, but disease of the arteries was shown by sclerosis of the aorta and chronic nephritis. Inspection of the wall of the aneurismal sac revealed a diffuse, rather marked thickening, with occasional calcareous deposits in the intima, together with signs of mesarteritis and a considerable collection of lymphocytes and polymorphonuclear leucocytes in the media. In view of the negative Wassermann test and the absence of other signs of syphilis, Moeller concludes from the findings in the arteries that the condition was caused by arteriosclerosis combined with high blood pressure due to nephritis.

Beadle, who collected 555 cases of aneurism of the arteries of the brain, believes that the diagnosis of intracranial aneurisms during life is next to impossible. Wichern does not agree with him. The records of the clinical symptoms and anatomical findings are astonishingly faulty. In the entire medical literature there are few works which describe the condition correctly.

The increasing monolateral oculomotor paresis in conjunction with a similar involvement of the trochlear and abducens nerves, the possible involvement of the trigeminus, and the absence of sensory or motor disturbances in the extremities point to extra-cerebral involvement in the cranial fossa. The fact that the condition is unilateral, the absence of "nutritive symptoms," and the bilateral involvement of vision speak against a tumor of the hypophysis. A dilated pupil is seldom noted in cases of aneurism. A syphilitic basal meningitis is seldom to be considered as usually this process is diffuse.

As an intracranial aneurism is dangerous to life, the treatment is of great importance. Medical treatment is without result. On the other hand, the removal, or even the intracranial ligating, of the growth is almost impossible. Long-continued compression on the carotid (Seller, Eyser) seems to have no effect. Hence, only the extra-cranial ligation of the carotid remains. The assumption that such ligation causes the disappearance of the aneurism by stopping the circulation is incorrect but the formation of thrombi which finally lead to recovery by means of apposition and organization has been demonstrated. The ligation of the internal carotid is therefore entirely justified.

SAXINGER (Z).

Walker, F. A.: The Collateral Routes of the Portal Vein (Zur Frage der Kollateralbahnen des Systems der Vena porta). *Nautschnaje Medyzina*, 1920, iv.

The author states that sufficient study has not been given to the anatomy of the system of the portal vein. The known anatomical facts do not explain satisfactorily why the ligation of the portal vein, an entirely separate system, does not cause harm to the body in general. The collateral routes already known can replace the portal vein only at times and incompletely. Research has been directed almost exclusively to the collateral routes outside the liver, particularly the connections with the neighboring venous systems, the superior and inferior venæ cavæ. Soppey alone mentions accessory portal veins of the liver. Even these collaterals, however, are insufficient. Hence the author's research which concerns chiefly anastomoses of the "hepatopetalic" type, that is, those which connect the portal vein with the intrahepatic branches.

From the physiological standpoint these anastomoses are of the greatest value, and their presence explains the cases of ligation of the portal vein which do not terminate fatally. Walker found these "hepatopetalic" anastomoses eight times in 160 cadavers examined (5 per cent). In addition to these anastomoses there are those of the "hepatofugalic" type which are more rare, being found in only three of the 160 cadavers (2 per cent). Hence the incidence of clearly pronounced anastomoses is 7 per cent. Most frequently encountered was one particular variety of the venous anastomoses of the "hepatopetalic" type which was similar to that described by Soppey in 1859, though on close examination the veins proved to be others not yet described. These veins are situated near the portal vein, they are not connected with its walls, they open directly into the liver at some distance from the hilus, and they have a diameter of .05 to 1 mm. Possibly they are of great importance in occlusion or ligation of the portal vein. The author proposes that the veins be named "venæ portæ accessoriæ propriæ" as they are able, when necessary, to take over the functions of the portal vein. Walker found them in six cadavers (4 per cent). In most cases they run a direct course.

One of the venous anastomoses of the "hepatofugalic" type, found by the author in one cadaver, is worthy of special mention. The vein ran from the portal vein posteriorly and toward the right to the posterior abdominal wall. At the adipose capsule of the right kidney it divided into small branches which anastomosed with the ramifications of the renal vein. This venous anastomosis was 0.75 mm. thick and 6 cm. long.

It is therefore evident that there are collaterals between the portal system and the vena cava system, not only under pathological conditions, but also under normal conditions. In addition to these, the author discusses also other anastomoses which connect the venous systems of individual organs belonging to the portal system. The intestinal veins make a series of

curves from which branches are sent off to the intestinal wall, forming a kind of loop. Two types can be distinguished in the vascularization of the intestine according to whether the branchings or the loops prevail: the "branch" and the "loop" type. The "loop" type is found more frequently (84 per cent). The type of vascularization of the intestine is of practical importance. The loop variety assures a better collateral blood supply in intestinal operations than the branch variety in which each branch vein represents an end vein. The venous system is weakest and most incomplete at the bends of the intestine, i. e., at the angles of the duodenum, at the transition from the duodenum into the jejunum, and at the angle between the cæcum and the ileum.

SCHAAK (Z).

Sistrunk, W. E.: The Kondoleon Operation for Elephantiasis; a Report of End-Results. *South. M. J.*, 1921, xiv, 619.

The author describes the Kondoleon operation for elephantiasis and discusses the late results obtained in patients operated on at the Mayo Clinic. An elliptical incision is made on one or both sides of the affected extremity for the removal of wide segments of skin and still wider sections of subcutaneous tissue and aponeurosis. If the leg is to be operated on, an elliptical incision is made on the outer side extending from the iliac crest to below the external malleolus. The knife is introduced parallel to the skin edge, separating the skin from the subcutaneous tissue for an inch or more. The skin is retracted to expose a wider area of tissue than the skin which is to be sacrificed. A wide quadrilateral strip of oedematous fat and aponeurosis is removed *en masse*, exposing the muscle throughout the length of the incision. The superficial and deep lymphatics are thus allowed communication and the oedematous extremity is thereby drained.

It is usually necessary to perform the same operation also on the opposite side of the leg. This may be done at the same time or within ten days or two weeks. Rest in bed with elevation and firm bandaging of the limb for two or three weeks will simplify the operation. Following this procedure the region will become much less oedematous, and especially much less vascular, thereby decreasing the shock of the operation. One-sixth grain of morphine is given before the operation and a second similar dose as soon as the patient has awakened from the anæsthetic. This also minimizes the shock of the operation.

Thirty-one cases of elephantiasis and two cases of lymphoedema are reported. The results on the whole were good. In many cases the extremity could be kept within normal limits by the persistent use of bandages. Patients who were having repeated attacks of erysipelas have had no recurrences of these attacks.

Before operation there should be a definite understanding between the surgeon and the patient with regard to the fact that the operation is to be done for the purpose of controlling a disease which, if left alone,

usually grows progressively worse, that a perfectly normal limb is not to be expected, and that it will be necessary for bandages to be worn following the operation. Secondary operations for the removal of portions of hypertrophied skin may be performed with the expectation of further improvement in the case of patients in whom considerable deformity remains after the first operation.

G. D. MAHON, M.D.

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Guthrie, C. G.: Gland Puncture as a Diagnostic Measure. *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 266.

The author's attention was first directed to the possibilities of gland puncture as a diagnostic measure through his study of a case of trypanosomiasis. The patient had contracted the infection three and one-half years earlier and had been under treatment which had caused an arrest of the disease but not a cure. When he came under the author's observation the symptoms had returned but physical examination was negative except for a palpable spleen and general glandular enlargement. Repeated examinations of the blood and spinal fluid, both direct and after various methods of concentration, were negative for trypanosomes, and inoculation of susceptible animals with blood and spinal fluid failed to produce infection. Aspiration of an enlarged cervical gland with a syringe and small needle, however, yielded one or two drops of fluid in which one motile trypanosome was found. This finding was confirmed by the removal of a gland which was used for intraperitoneal inoculation of six white rats; all of the rats developed trypanosomiasis from which they eventually died.

Diagnosis by gland puncture is not a new method in trypanosomiasis, having been previously recommended by Grieg and Gray and used with success by various workers in the sleeping sickness regions of Africa.

In selecting a gland for puncture three requirements are essential:

1. The gland must be of a size sufficient to permit aspiration; tiny shot-like glands are not suitable for this purpose.
2. The location of the gland should be such as to render firm fixation possible.
3. Injury of important structures must be improbable.

By observing these points it has been possible in each instance to secure material from the gland and to avoid trauma of surrounding organs.

Thus far, there has been an opportunity to apply this method of diagnosis in cases of syphilis, tuberculosis, Hodgkin's leukæmia, acute and chronic lymphoid leukæmia, acute and chronic myeloid leukæmia, simple adenitis, and in one case each of trypanosomiasis and metastasis of malignant disease. A positive diagnosis based upon the recovery of the

etiological agent of the disease has been possible in a number of cases.

The shortcomings of the author's method are as follows:

1. From a fibrotic gland very little cellular material may be recovered, sometimes not enough to establish a diagnosis.
2. The cellular picture obtained is necessarily that from a very limited area of the gland, quite possibly not the area in which characteristic changes have occurred. A tuberculous gland, for instance, may show involvement in only one pole and none near the site of the puncture.
3. The architecture of the gland is not shown as a rule, although occasionally a small bit of the gland is removed intact in the course of the puncture. The relation of the cellular elements to the reticulum, the amount of connective tissue reaction, and the question of the invasiveness of the process in the gland are points on which information is rarely obtained from gland puncture.

Although these three points serve to limit the value of the method as a diagnostic aid, the author points out that in the great majority of glands which he has punctured there has been no difficulty in securing adequate material for satisfactory preparations; the disease process was not localized but was general throughout the gland, and the cellular picture was sufficient to establish the diagnosis without a knowledge of the architecture of the gland.

Guthrie therefore sets forth briefly the advantages of the method as follows:

1. Rapidity. Not infrequently a definite diagnosis may be made in ten or fifteen minutes.
2. Thin preparations like blood films are secured, suitable for the application of a blood stain or special stains for cells, bacteria, or protozoa, and permitting the use of an oil-immersion lens in their study.
3. The procedure is practically painless—less painful than an ordinary venipuncture—and leaves no scar.
4. It does not interfere with subsequent excision and histologic study of the gland.

GEORGE E. BEILBY, M.D.

Orlowski, W.: The Diagnosis of Abdominal Tumors (*Diagnostik der Bauchtumoren*). *Przegl. lek.*, 1921, lx, 49.

The author is of the opinion that the usual methods of inspection, palpation, and percussion practically always lead to a correct diagnosis of the location of an abdominal tumor. The patient should be examined not only in the dorsal position but also standing, bent over, and in the knee-chest position, on expiration, and on deep inspiration. When the abdominal wall is tense, he should be examined also in a warm bath.

It must be determined first whether the tumor is in the abdominal wall or the abdominal cavity. To discover the point of origin in the latter case the normal topographical position of the organ under consideration should be marked on the surface of the

body and compared with the position of the tumor. The author illustrates this procedure with drawings. One must not forget that organs may change from their normal position and cause a corresponding change in the position of the tumor, but this can be determined usually by the fact that the tumor can be pushed back to the normal position of the organ. This is not possible when the tumor is adherent to its surroundings or when the growth is a tumor of the omentum.

Also of importance in the diagnosis is the direction in which the tumor grows. A complete syndrome is to be considered which depends on the mobility of the tumor in relation to respiration and position, its movability on palpation, its relation to the gastrointestinal tract on inflation of these organs, and finally its form.

The author goes somewhat into detail regarding the tumors of special organs, and includes in his article a drawing which shows the position of neoplasms in relation to the stomach and the large intestine.

The methods discussed must be supplemented by a study of the X-ray picture and the entire clinical syndrome.

JURASZ (Z).

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Ecker, E. E., and Goldblatt, H.: Thyroidectomy and Parathyroidectomy with Relation to the Development of Immune Substances. *J. Exper. M.*, 1921, xxxiv, 275.

The authors state that their investigation of the literature disclosed the unsettled state of the problem of thyroidectomy and parathyroidectomy with relation to the development of immune substances. The reports have been concerned particularly with the site of antibody production. Removal of important organs, preceded and followed by an investigation of natural or acquired antibodies of various kinds, has been resorted to by numerous investigators in the hope of finding one organ in the body which has an undoubted relation to the development of immune bodies, or of proving that no particular organ is responsible, the phenomenon being entirely humoral.

Gates performed partial adrenalectomy and studied the development of anti-hen hæmolysin. The results were negative. Hektoen excised the spleen and pancreas and portions of the liver and intestinal tract. Splenectomy caused a diminution in the development of immune substances but the other procedures had no definite effect. Although thyroidectomy has been performed by a number of investigators on various animals, the dog, fox, chicken, horse, and rabbit, the relation of the thyroid gland to the development of immune bodies remains an unsettled question because the results were conflicting. The relation of the parathyroids in particular to the production of immune substances is still more obscure.

In going over the work of many investigators, the authors were often very uncertain whether the thyroid was removed alone or with the parathyroids. The anatomy of the thyroparathyroid apparatus varies in different animals. Since there is good reason to believe that these glands differ in their development and function, it is reasonable to assume that their removal would have a variable effect, if any, upon the body and its functions in different species. It is important, therefore, to know exactly what has been removed. It seems that lack of clearness on this point accounts, in part at least, for the often contradictory results obtained.

Hektoen, taking advantage of the work on iodo-benzoic compounds by Loevenhart and his associates, tested the effect of the administration of iodoxybenzoate of soda on the production of antibodies. He found that dogs which had received iodoxybenzoate produced anti-goat hæmolysin of a higher titer than that of dogs which had received injections of iodobenzoate and than that of control dogs which had not received any injections. He concluded that the oxygen element was responsible for the difference. The thyroid gland is supposed to have a definite relation to the process of internal oxidation in the body. In the authors' experiments, however, the removal of the entire thyroid with the upper parathyroid glands did not inhibit the production of hæmolysin. In fact, the average titer of the serum of thyroidectomized animals given intravenous injections of sheep's blood was higher than that of the controls. In view of the divergent results the question of the effect of internal oxidation on the development of immune bodies remains unanswered.

With regard to whether the general disturbance created in these animals is responsible for the effect on antibody production the authors state that during the first few days following the operation the thyroparathyroidectomized rabbits showed signs of much greater disturbance than the thyroidectomized animals, but by the time the injections were begun the condition of both was approximately the same and both gradually developed moderate cachexia. The thyroidectomized rabbits, however, developed a hæmolysin of relatively very high titer as compared with that of the control animals, while the thyroparathyroidectomized animals developed a very low titer hæmolysin as compared with that of normal controls.

The results of the experiments reported are summarized as follows:

1. After thyroidectomy with partial parathyroidectomy the maximum and average hæmolytic titers of the sera of rabbits injected intravenously with sheep blood are equal to, or higher than, those of normal animals given similar injections.
2. Thyroidectomy with partial parathyroidectomy does not inhibit antibody production. This fact is in accord with the results of Garibaldi, Launoy and Levy-Bruhl, Lerda and Diez, and others.

3. Thyroidectomy with partial parathyroidectomy does not cause serious disturbance in the adult rabbit. If the operation is performed properly, the animals survive and the cachexia is moderate.

4. After complete thyroparathyroidectomy a small proportion of the animals survive even after developing very severe tetany. Those that recover do not show further signs of serious disturbance, but in time develop a moderate degree of cachexia no greater than that of the thyroidectomized animals.

5. Thyroparathyroidectomized rabbits develop anti-sheep hæmolyisin of a uniformly low titer averaging one-fifth that of the controls.

6. Injection of bovine blood into rabbits that survived complete thyroparathyroidectomy from one to two months previously results in the production of hæmolyisin of a uniformly low titer compared with that of normal animals similarly treated.

GEORGE E. BEILBY, M.D.

ROENTGENOLOGY AND RADIUM THERAPY

Arnould: Surgical Incisions After Roentgen Therapy (Incisions chirurgicales après roentgen-therapie). *J. de méd. de Bordeaux*, 1921, xcii, 407.

Surgery combined with roentgen therapy (especially pre-operative X-ray treatment) has become a matter of general practice in the treatment of tumors. The author points out that the X-ray may cause skin lesions and changes which prevent healing of a surgical wound. He mentions a case in which the healing of an abdominal wound was delayed more than six months by a dermatitis demonstrated by biopsy which was present at the time the incision was made.

A late radiodermatitis may develop on the occasion of a surgical traumatism in a region sensitized by the X-rays, and an incision made over an old X-ray scar may fail to heal. Therefore no surgical act (puncture, incision) should be practiced in the vicinity of tissues which have become pigmented following the application of the X-ray nor in the site of an old radiodermatitis scar.

W. A. BRENNAN.

Russ, S.: Some Contrasts in the Effects of the X-Rays and Radium upon Blood Cells. *Brit. M. J.*, 1921, ii, 268.

Studies on rats and on man have shown that certain measured amounts of radiation produce regular changes in the number of lymphocytes but irregular changes in the polynuclear leucocytes.

The exposure of rats to X-rays of medium intensity and moderate penetrating power always produced a marked fall in the number of circulating lymphocytes. The reduction amounted to about 50 per cent for an exposure of twelve seconds. The normal lymphocyte count was regained in about twenty-four hours. A prolongation of the time of exposure even to five minutes made no appreciable difference in the effect.

Observations on polynuclear leucocytes showed that a rise in their numbers appeared almost as probable as a fall after X-ray exposure.

The blood counts on man were made on the blood of patients suffering from malignant disease and receiving a large quantity of radium radiation. In a majority of the cases the blood changes following exposure for four or five hours were significant. A greater regularity was observed in the effect on the lymphocytes than in the effect on the polynuclear leucocytes. Of thirty-one cases, twenty showed a reduction in the number of circulating lymphocytes; five showed an increase; and in six no change was noted, that is, the variation was less than 8 per cent. Figures for the polynuclear cells show that the probabilities of an increase, decrease, or no change were nearly equal.

The red blood cells also showed changes after a single exposure to the gamma rays. This was not pronounced, however, unless the radiation was very prolonged. Details of the blood counts relating to the author's thirty-one cases are given in a report to the Medical Research Council entitled "The Use of the Gamma Rays from a Large Quantity of Radium in the Treatment of Malignant Disease," by W. S. Lazarus-Barlow, Helen Chambers, and the author.

MARTHA ALDRICH.

Mottram, J. C.: The Use of Blood Counts to Indicate the Efficiency of X-Ray and Radium Protection. *Brit. M. J.*, 1921, ii, 269.

A study was made to determine whether or not the devices designed to protect those who work with the X-ray and radium are efficient. Two sets of facts were reviewed: (1) those related to the biological action of radiation, and (2) those related to the blood changes.

With regard to the biological action of radiation, it is known that various tissues differ widely in susceptibility. Nerve cells show no change after large exposures, whereas skin, blood vessels, connective tissue, hair follicles, reproductive cells, lymphoid tissues, and blood cells are especially sensitive.

Experiments on rats have shown that by means of their blood changes X-radiation can be detected when a photographic plate gives no record. It may be concluded that in the absence of blood changes the worker has received no more than a harmless amount of exposure to radiation.

It might be thought that soft X-rays and beta rays, which are largely absorbed in superficial tissues, would cause skin changes and no blood changes, but there is evidence to show that, provided the ionization is kept constant, the blood changes are independent of the type of radiation.

A single exposure to radium causes a sudden fall in the number of circulating lymphocytes from which there is gradual recovery. A series of exposures holds the lymphocytes below the normal level. This is the condition found in X-ray and radium workers who are subjected to small daily doses of radiation.

An estimation of counts shows an abnormal lymphocyte distribution in X-ray and radium workers; also an abnormal polynuclear count. The radium workers show a greater diminution in polynuclears.

The red cells are not so sensitive to radiation as the leucocytes; therefore, the development of anæmia indicates a serious over-exposure. In radium workers the number of red cells is diminished, while the hæmoglobin content is less affected. This points to an interference with the production of red cells and polynuclears in the bone marrow which has been confirmed by experimental work on rats. The gamma rays of the radium injure the bone marrow while the less penetrating X-rays exhibit effects chiefly on lymphocytes and lymphoid tissue unprotected by bone.

A criterion based on the data given is presented for the protection of workers with X-rays.

MARTHA ALDRICH.

Webster, J. H. D.: X-Ray Treatment of Two Cases of Otosclerosis. *Arch. Radiol. & Electrotherapy*, 1921, xxvi, 69.

The author makes no claim for originality in applying roentgen therapy to otosclerosis; he cites the experience of a number of men who have previously tried it. He discusses the rational basis for the treatment and gives the results in two cases. In reviewing the various theories as to the etiology and pathology of otosclerosis he states that he is inclined to regard the condition as a form of osteitis fibrosa or osteofibromatosis which is associated with increased vascularity. Hence he believes the ischæmic power of radiotherapy indicated in suitable cases. However, as the etiology and essential nature of otosclerosis are still largely unknown or in dispute and the course of the condition is prolonged usually for many years (often with intermissions or natural arrest), it is extremely difficult to make an estimate of the true value of any method of treatment.

In well-established cases, which are perhaps the great majority of those presented for treatment, permanent bony damage has already occurred at the stapes foot, with possibly secondary nerve impairment. Such cases afford no fair test of the value of radiation. It is only in the earliest stages when there are young, actively proliferating or hyperfunctioning cells that radiation can be expected to give a satisfactory degree of benefit. The most that can be hoped for in late cases is an arrest of the process at the stage to which it has progressed. In early cases it may be possible, not only to arrest the condition, but to cause some slight improvement. The method seems to deserve full investigation as even if it only arrests the usually inevitable progress of this common and disabling complaint (perhaps even only in certain types of cases, as may be defined by further research on the subject), it will have achieved a great therapeutic success in a region which hitherto has been, for the most part, the despair of the internist and the otologist.

Detailed histories of the author's two cases are given together with the results obtained by roentgenotherapy. An extensive bibliography is appended.

ADOLPH HARTUNG, M.D.

Widmann, B. P.: Multiple Osteochondromata. *Am. J. Roentgenol.*, 1921, n.s. viii, 462.

After briefly commenting upon the literature regarding multiple osteochondromata and discussing the nomenclature, pathology, and possible etiologic factors, the author reports a case in which the roentgenographic findings showed a disturbance in the ends of all the diaphyses of the long bones and in the ribs. This disturbance varied from a slight thickening to actual tumor formation $1\frac{1}{2}$ in. in thickness. All of the tumors had the characteristics of bone; that is, they consisted of cancellous tissue more or less regularly arranged and showing no destructive effects and none of the appearances characteristic of true tumors.

The lower extremity of the right humerus was shortened, thickened to twice its normal diameter, and roughened by a number of separate nodules. In the left wrist the exostoses extended between the lower extremities of the radius and ulna and were apparently united by true bony union. The left ulna was considerably shortened in comparison with the radius, probably because of interference with the normal growth of the diaphysis in this bone. In the right elbow there was apparently shortening of the ulna with considerable thickening of its upper extremity and comparative overgrowth in the length of the radius which caused dislocation. At the lower extremity of the tibia and fibula of both legs there was possibly shortening of the tibia and corresponding elongation of the fibula, due probably to this overgrowth. Exostoses were present also about the diaphysis of the os calcis.

In the author's opinion this condition is undoubtedly a constitutional disease. It has to do with the growth in length of the long bones and must involve a disease of the organs controlling such growth. It would seem, therefore, to be primarily a disease of the endocrine system. In some cases a hereditary tendency is evident.

ADOLPH HARTUNG, M.D.

Carman, R. D.: Two Contrasting Cases: (1) Adenocarcinoma of the Stomach Revealed by Roentgenograms But Not Palpable on Exploration by the Surgeon; (2) Gastric Ulcer Not Shown by the Roentgen Ray, But Found at Operation. *Am. J. Roentgenol.*, 1921, n. s. viii, 480.

The author reports two cases observed at the Mayo Clinic, one of which indicates the difficulty experienced by the surgeon in locating a lesion after it had been demonstrated by the roentgen ray, and the other, that the roentgen ray is not infallible in the diagnosis of gastric ulcer.

CASE 1. The patient, a man 42 years of age, had noted increasing weakness for eight months and during the two months previous to examination had had constant, dull epigastric pain without relation to the ingestion of food. Recently his appetite had been poor. The general examination, the Wassermann reaction, and examinations of the blood and urine were negative. Free hydrochloric acid was

absent from the stomach contents. Roentgenograms revealed a lesion on the posterior wall of the stomach near the greater curvature.

At operation careful palpation of the stomach failed to reveal any lesion. When the stomach was opened a superficial ulcerated area of adenocarcinoma was found at the site indicated by the roentgen ray; this was shallow and there was no palpable induration at the edges or in the surrounding tissue.

This case illustrates the value of the roentgen-ray findings and the necessity for careful surgical co-operation.

CASE 2. The patient, a man 49 years of age, had a history of thirty-one years of gastric distress consisting of attacks of pyrosis and epigastric pain appearing about two hours after meals and accompanied by "water brash." Moderate relief was given by food and soda. Gastric analysis was negative. The roentgenogram showed a duodenal ulcer and a moderate six-hour retention.

The duodenal ulcer was found at operation and excised. The pylorus was hypertrophied and the stomach dilated, but as there was no duodenal obstruction the surgeon was unable to account for the large stomach and the retention. Since 55 per cent of gastric ulcers produce six-hour retention from the barium meal, further examinations of the stomach were made. A small ulcer of the lesser curvature not discoverable by roentgenologic examination was then found. In a minority of cases of concurrent gastric and duodenal ulcer the roentgen-ray examination discloses only one of the ulcers.

A. W. BRYAN, M.D.

Rubin, I. C.: A Manometer and Flow Volumeter for Transuterine Peritoneal Inflation to Determine the Patency of the Fallopian Tubes in Cases of Sterility. *Am. J. Roentgenol.*, 1921, n.s. viii, 459.

The apparatus described makes it possible to measure the quantity and the flow of oxygen or carbon dioxide gas used in insufflating the uterus to determine the patency of the fallopian tubes. Combined with it is a manometer of the "tycos" or mercury type which indicates the pressure at the time the gas is flowing. The displacing of water from another vessel at a certain rate of flow to estimate the volume of gas is rendered unnecessary. In this apparatus the pulsating type of water-displacement meter is used. It is hydraulic in principle, scientific, accurate, and dependable. Its various parts are described in detail and its *modus operandi* is explained.

For the purpose of determining the patency of the fallopian tubes four pulsations delivering 160 c.cm. of gas are all that is necessary. In thin persons with patent fallopian tubes from two to three pulsations will suffice to produce the subphrenic pneumoperitoneum which can be seen clearly with the fluoroscope. The pressure reading is of considerable importance, and it has been found that the rate of flow is best regulated previous to a rise of 100 mm. within fifteen

seconds. With this rate established the gas is allowed to pass through the volumeter and thence through the outlet tubing and cannula into the uterus.

The pressure required to overcome the resistance of the uterus and tubes when there is no tubal obstruction to the free passage of the gas will vary between 40 and 100 mm. On reaching these points it will fall sharply or slowly or fluctuate about them. In the non-patent tubes the pressure rises steadily to a point well beyond 200 mm. It is not necessary to carry it beyond 250 mm. as in all the cases examined so far this pressure was found to indicate occlusion.

The apparatus may be used to advantage also in direct transperitoneal inflation by abdominal puncture. In such cases the pressure gauge is not so important, but it provides an accurate volumetric measure of the gas introduced into the peritoneal cavity. Thus far the apparatus has been used in 225 cases and has given complete satisfaction.

ADOLPH HARTUNG, M.D.

LEGAL MEDICINE

Decisions Under the Harrison Narcotic Law. *Rothman et al. vs. United States (U. S.)*, 270 Fed. R., p. 31; *Di Preta vs. United States (U. S.)*, 270 Fed. R., p. 73; *Dysart vs. United States (U. S.)*, 270 Fed. R., p. 77.

In the case of Rothmann et al. the United States Circuit Court of Appeals, in affirming judgment of conviction, stated that they were indicted for unlawfully selling heroin and for conspiracy respecting such sale. Rothmann was a physician, and one of the other defendants was the owner of a pharmacy. The court also followed the rule that when a government detective, suspecting that a person is engaged in an unlawful business, seeks information directly from him, under an assumed name, and that person responds thereto, violating a law of the United States, he cannot, when indicted for the offense, set up that he would not have violated the law if the inquiry had not been made of him by the government official. Ignorance of the law excuses no one. It could be no excuse that the defendants relied on a treasury decision which was wrong. If a conspiracy was proved to have existed between the defendants, it was not necessary to prove that all of the defendants did the overt acts which they were alleged to have done. All that was necessary was that one or more of such parties did an act to effect the object of the conspiracy. Every act of each member of the conspiracy in pursuance thereof was, in the contemplation of the law, the act of them all and constituted evidence against each of them.

The same court, in affirming a judgment of conviction in the second case, wherein Di Preta, a physician, was the defendant, stated that the testimony was ample to the effect that the defendant sold to all and sundry so-called prescriptions for what are called "habit-forming drugs" and sometimes suggested that the recipients of these prescriptions should have them filled at the drug store of one, Petraglia. The indict-

ment charged Petraglia with dispensing the drug substantially according to the language of the statute, which was sufficient. It then charged Di Preta with aiding and abetting under Section 332 of the Criminal Code, which makes a principal of any one who aids or abets in the commission of "any act constituting an offense defined by any law of the United States." The count was not invalid because it did not negative the exceptions of the statute in favor of physicians, and because it did not give any details as to how or in what manner Di Preta abetted Petraglia. But a prescription issued under the circumstances amply shown in this case is not a prescription at all. Consequently it is no exception; nor is it necessary to negative the exceptions under this section of the statute. At common law Di Preta would have been an accessory before the fact, but the penal code makes him a principal. Thus the acts of the principal become the acts of the accessory or aider, and such accessory may be charged as having done the act himself and may be indicted and punished accordingly.

In the third case, wherein the United States Circuit Court of Appeals affirmed a judgment of conviction of the defendant, Dysart, a physician who was registered under the law, the court held that there was no variance between the offense charged in the indictment and the evidence adduced where the indictment charged unlawful sales of morphine sulphate and what the defendant did was to issue prescriptions. Nor was there error in admitting evidence to the effect that the defendant had issued prescriptions to a large number of persons other than those described in the indictment, when in his charge to the jury the trial court limited the effect of such evidence to the intent with which the prescriptions for persons named in the indictment were issued, and distinctly charged the jury that conviction could not be based on prescriptions for persons not so named. As so limited and explained, the evidence was admissible. It threw light on the intent of the defendant in respect to the vital question in the case as to whether he was lawfully or unlawfully dispensing drugs in the course of his practice.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Byford, H. T.: *The Cure of Cervical Endometritis by the Aid of Multiple Scarification.* Chicago *M. Rec.*, 1921, xliii, 511.

The treatment the author advocates consists in using the old treatment in a new way that makes it efficient. It is a speeding up and intensification of the puncturing and local stimulation. The scarificator used is bayonet pointed and cuts in three directions, thus leaving patulous openings for the escape of mucus and the penetration of the solution. The solution consists of one part each of iodine crystals and glycerine and two parts of phenol. For an area of almost complete degeneration double the relative amount of the iodine is employed in order to obtain quicker and somewhat more radical results. The only area in which the stronger solution can do harm is at the edge of the cervical cavity where the mucosa will become reinverted and the columnar epithelium should be preserved.

The technique employed is quite simple and can be carried out at the office. After the vaginal fornices, cervix, and cervical canal have been wiped dry with absorbent cotton they are disinfected with a 5 per cent solution of phenol in water. Five or six punctures are made into and about each retention cyst that can be seen or felt, and also into any red spots or areas that indicate destructive inflammation of glands or obstruction of follicles. Absorbent cotton is then pressed firmly against the surface to express mucus plugs and stop the oozing of blood. With an applicator tipped with a tuft of non-absorbent cotton, the solution is applied freely to the scarified areas and to the mucosa both of the vaginal portion and the cervical cavity. The saturated tuft of cotton is pressed firmly against the parts in order to force the iodized phenol into the glandular pockets and punctured tissues. A dry tampon is then placed against the cervix and the patient instructed to remove it in a few hours. The author sometimes begins the treatment by dilating the cervix slightly with a large sound. This stretches the mouths of the glandular pockets within the cervix, and expresses much of the tenacious mucus. The treatment is repeated every three or four days until no cysts can be seen or felt.

From fifty to a hundred or more punctures are made in the cystic area or areas and followed by the application of the iodized phenol, with or without the previous passage of the sound, at weekly intervals for three or four months.

In this way the superficial cysts are destroyed, deeper ones are rendered accessible and are evacuated, and the penetration or absorption of a large amount of iodine is secured. After all signs of inflammation and cyst formation have disappeared the patient

is discharged with directions to return at the end of three or four months. A few treatments may then be required for the cure of the glands which had been infected or affected previously, but which had not been in evidence. E. L. CORNELL, M.D.

Wharton, L. R.: *Rare Tumors of the Cervix of the Uterus of Inflammatory Origin—Condyloma and Granuloma.* *Surg., Gynec. & Obst.*, 1921, xxxiii, 145.

Condyloma of the cervix is one of the rarest of gynecological disorders. Etiologically, pathologically, and clinically, there are two distinct types of condyloma of the cervix: the gonorrhœal and the tuberculous. When complications are not present, the symptoms in these two types may be identical, the chief complaint being the presence of a profuse purulent vaginal discharge which occasionally may be tinged with blood. From the viewpoint of both the history and the clinical findings, there may be no small resemblance between condyloma and malignant tumors of the cervix.

Gonorrhœal condylomata may occur singly as isolated pedunculated tumors or in clusters of papillomata which may almost entirely cover the cervix. These masses may present varying grades of inflammatory reaction. Gonorrhœal condyloma of the cervix may be accompanied by similar lesions on the vulva and perineum and also by salpingitis and its many manifestations, but in the author's experience the endometrium is usually not affected. The primary focus of infection appears to be in the cervical glands. In the treatment of gonorrhœal condyloma it is necessary to clean up the focus of infection and to remove the local growth. Curettage of the uterus is unnecessary and should not be performed.

Tuberculous condyloma of the cervix is almost always accompanied by other manifestations of the disease. There is usually a concurrent tuberculous endometritis and salpingitis, and very frequently other lesions may be found. For this reason the operative treatment of the cervical lesion should be undertaken only after a careful study has been made and on the basis of sound surgical indications.

In cases of gonorrhœal condyloma the outlook is uniformly good. In cases of tuberculous condyloma the prognosis depends entirely upon the nature of the concomitant lesions and the method of treatment instituted. E. L. CORNELL, M.D.

Farrar, L. K. P.: *The Incidence of Pulmonary Embolism and Thrombosis Following Hysterectomy for Myomata Uteri.* *N. York State J. M.*, 1921, xxi, 324.

The most frequent cause of postoperative pulmonary complications following hysterectomy for

myomata uteri is pulmonary embolism or thrombosis. The source of pulmonary embolism or thrombosis is a thrombosis of the pelvic veins, the veins of the lower extremities, or the right heart. Thrombosis of the pelvic veins occurs much more frequently than thrombosis of the lower extremities.

Thrombosis or embolism may develop during an operation or immediately afterward. The most frequent time seems to be in the first forty-eight hours. In the order of their most frequent occurrence the symptoms are pain, a friction rub, cough, bloody sputum, râles, dullness, and alteration of breath sounds. These signs are premonitory of a thrombosis, but the evidence of thrombosis in the veins of the lower extremities or pelvic veins does not appear until later. The physical findings at the onset are similar to those of lobar pneumonia or pleurisy but the clinical picture soon reveals the nature of the condition. In the differential diagnosis the X-ray may be of value.

Thrombosis and embolism occur more frequently after hysterectomy for large myomata and less frequently after operation on pus tubes and ovarian abscesses. The causes are: (1) an enfeebled circulation due to dilation of venous trunks, especially of the pelvis and lower extremities, venous stasis, lowered blood volume due to hæmorrhage or shock, or myocardial insufficiency; and (2) infection.

The treatment should be prophylactic and directed toward improving the circulation by strengthening the heart muscle and the walls of the blood vessels and increasing the hæmoglobin of the blood. The importance of rest in bed as a preliminary to operation to relieve the pressure of large myomata on the veins of the pelvis and lower extremities, the use of blood transfusion before operation in cases of marked anæmia, and the maintenance of the blood volume during operation by means of gum glucose given intravenously should be emphasized.

The author reviews 130 cases he operated upon for uterine myomata from March 1, 1918, to March 1, 1920. In these two years all ward patients with large fibroids requiring removal were kept in bed from five to seven days previous to the operation. No embolism or thrombosis occurred in any instance. In the cases of private patients who were not kept in bed previous to the operation, but usually operated upon the day after entrance to the hospital, a fatal embolus occurred once and venous thrombosis six times although exactly the same operative technique was employed as for the ward patients.

E. L. CORNELL, M.D.

De Rouville, G.: The Fight Against Uterine Cervical Cancer; Early Diagnosis and Ample Intervention (La lutte contre le cancer du col de l'utérus; diagnostic précoce et intervention large). *Rev. franç. de gynéc. et d'obst.*, 1921, xvi, 342.

De Rouville states that despite its apparent lack of power, medical science is not entirely disarmed in the presence of cancer. The mode of origin and the

development of malignancy and the various conditions which favor it have been discovered. It is known that in the beginning cancer is a local disease and that a cure can be effected by extirpating or destroying all the cellular elements which constitute it. Hence a sufficiently extensive operation performed while the lesion is still limited is the logical therapeutic procedure.

De Rouville throws the onus of diagnosis on the family physician, stating that he should insist on a vaginal examination whenever a suspicious sign is noted, and if this does not suffice, should remove for histologic examination a section of any growths which may be found near the cervix.

All physicians should have an unshaken faith in the curability of cancer by early radical operation. This faith De Rouville fears is possessed by only a few. He therefore urges a campaign to educate not only the laity but also physicians and midwives with regard to the efficacy of early operation. The effects of such a campaign in Germany, France, and elsewhere are shown by improvement in the morbidity and mortality statistics of cervical cancer. In his own practice it has been De Rouville's custom to give his female patients a booklet of information regarding cancer and its treatment. Other surgeons also have begun similar propaganda.

De Rouville states that in France surgeons are almost all in agreement regarding the superiority of the abdominal route in the treatment of cancer of the uterine cervix as however limited the lesion may appear to be clinically it is impossible to know exactly how far it extends. In France the operation for the radical cure of uterine cancer is more conservative than the very mutilating methods used in Germany by Wertheim. Bumm and other French surgeons believe that while the surgery of cancer must be radical, it should respect anatomy and physiology, this being particularly necessary when the lesion is not advanced. W. A. BRENNAN.

Cullen, T. S.: Early Squamous-Cell Carcinoma of the Cervix Accidentally Discovered When the Body of the Uterus Was Being Curetted for Hæmorrhage Caused by Hyperplasia of the Endometrium and by a Small Submucous Myoma. *Surg. Gynec. & Obst.*, 1921, xxxiii, 137.

The author reports the microscopic findings in scrapings from curettage in a case of early carcinoma of the cervix in a single woman 46 years of age who suffered from excessive hæmorrhage at her menstrual periods. Examination of the scrapings from curettage showed the typical cell nests of squamous epithelial carcinoma. Therefore a Wertheim operation was done.

The author shows by illustrations the early proliferation with the production of finger-like processes sharply defined from the surrounding tissues. In certain areas the cells were deeply stained, had lost their normal relations, and presented decided variations in the size of their nuclei. A typical epithelial pearl was present.

R. E. CHRISTIE, M.D.

ADNEXAL AND PERI-UTERINE CONDITIONS

Tuffier, T.: A Surgical Study of 230 Ovarian Grafts
(Étude chirurgicale sur 230 grâffes ovariennes).
Bull. Acad. de méd., Par., 1921, lxxxvi, 99.

During the past fourteen and one-half years Tuffier has implanted 230 ovarian grafts. Two hundred and fourteen were fresh-tissue grafts and sixteen were grafts of tissue preserved in cold storage. The operation was performed after a total or supravaginal hysterectomy in sixty cases, after oöphorectomy with total preservation of the uterus in 156 cases, and after oöphorectomy and subtotal hysterectomy in four cases. The circumstances in ten cases are not stated.

There were no deaths due to the implantation but four patients died from abdominal infection due to the original disease.

When the graft does not take, it disappears in from six months to two years, leaving only a small nucleus which is itself finally resorbed.

The graft was placed in the subcutaneous cellular tissue in seventy-one cases, in the subperitoneal cellular tissue in fifty-four cases, and in the posterior part of the mammary gland in other cases. With regard to seventy-one cases the site of implantation is not definitely stated.

The transplantation of a graft of ovary from one woman to another was done in twenty cases. In 203 cases the ovary was removed from the abdomen and transplanted into the subcutaneous or subperitoneal tissue of the same woman. In six cases homotransplantation and autotransplantation were both done.

The transplantation of one or both ovaries from one woman to another never restored physiological function; it did not re-establish menstruation or suppress menopausal disturbances though in the case of one young woman it caused perhaps some slight diminution of the menopausal disturbances and in certain other cases obesity was less marked than is usual in women past the menopause.

In cases of autotransplantation the transposed ovary was normal, sclerous, or cystic and often removed from a partly infected area. Castration was necessary in 141 cases of salpingitis, thirty-five cases of fibromata, and five cases of extra-uterine pregnancy. In other instances it was indicated by various pathologic complications.

The nature of the disease and its duration had no influence upon the therapeutic results of the grafting. The patient's age, however, was of importance as menstruation is rarely re-established in a woman over 40 years old.

The graft does not generally cause pain and there is no symptom due to its presence for four or five months. From the fifth to the seventh month, if the graft is efficacious, it becomes periodically increased in size and congested perhaps for a week prior to menstruation. The return of menstruation can be obtained only when at least two-thirds of the uterus is preserved. Extirpation of the fundus of the uterus does not prevent the re-establishment of menstruation.

Of seventy-three cases in which the ovary was transposed and the uterus preserved, menstruation has been regular in fifty-six (76.71 per cent). The youngest patient was 18 and the oldest 41 years. The ages of the other patients ranged from 18 to 40 years. Menstruation usually is re-established from five to seven months after the transplantation. It appears that the graft can resume its function only after its blood supply has been re-established. The date of the reappearance of menstruation is of importance. If it appears two months after the transplantation Tuffier considers it due to a section of ovary left at operation. In such cases the graft does not show a periodic increase in size.

During the entire period between the operation and the appearance of menstruation the patient shows the usual pre-menopausal symptoms. The re-established flow is often not as regular nor of the same quantity or duration as the normal flow. In fourteen cases of ovarian transplantation menstruation persisted for six months; in thirteen, from six months to a year; in eighteen, from one to two years; in four, from two to three years; in one, for more than three years; and in one, for more than twelve years. In thirteen cases it ceased within three years. The therapeutic results of the transplantation are therefore temporary.

The autograft alone can re-establish menstruation. The site of the transplant does not appear to have any particular influence. Transposed ovaries have a new vascularization, but the duration of their vitality is below normal and they undergo early senescence.

W. A. BRENNAN.

EXTERNAL GENITALIA

Fothergill, W. E.: The End-Results of Vaginal Operations for Genital Prolapse. *J. Obst. & Gynec. Brit. Emp.*, 1921, xxviii, 251.

An inquiry into the end-results of operations on cases of genital prolapse having been originated by the North of England Society, the author presents his own technique and figures indicating the nature of the results secured after a lapse of years and under the stress of parturition.

Clinical experience has taught and anatomists have demonstrated that the uterus, vagina, and bladder are kept in place mainly by lateral combinations of unstriated muscle and connective tissue known as the parametrium and paracolpos. In applying this knowledge practically in anterior colporrhaphy, the incision is carried well up and out on either side of the cervix, exposing the paracolpos, so that closure of the wound brings together in front of the cervix structures formerly at its sides. If the colporrhaphy incision is carried round behind the cervix, instead of in front of it, anterior colporrhaphy and amputation of the cervix may be combined readily in a single operation and will overcome an exaggerated narrowing of the vagina. In cases of rectocele, the colpo-perineorrhaphy of Donald was done. The end-results from the use of this technique are cited from a

series of 156 cases. One hundred and fifty of these patients stated that they were cured and two of the remaining six were found anatomically free from prolapse. Therefore successful results were obtained in 97 per cent of the cases. About one-third of the patients were past the menopause.

Amputation of the cervix combined with anterior colporrhaphy was done in 124 cases. In the remainder the cervix was retained. A few required only colo-perineorrhaphy for rectocele. No case of mere perineal repair is included. The only variety of prolapse occurring in nulliparous women was elongation of the cervix with inversion of the vaginal walls from above downward. Thirty-two cases were examples of this type.

Since the operation, twenty-one of the women under 40 and three over 40 have borne children, and two others have become pregnant. Of these twenty-six, no less than twenty-three had the cervix removed by the combined operation. Thirty children have been born to the twenty-four patients, and prolapse sufficient to cause inconvenience has returned in only one case.

From these results the conclusion is drawn that vaginal operations give permanent benefit in all varieties of prolapse, do not prevent pregnancy, and yield a result that, in a large proportion of cases, stands the test of parturition.

The author deprecates the additional burden of abdominal intervention, from the viewpoint of both the patient and the operator, and advocates a more widespread knowledge and use of vaginal surgery.

N. K. FORSTER, M.D.

MISCELLANEOUS

Von Jaschke, R. T.: Pain in the Lower Abdomen as a Cause of Error in Gynecological Diagnosis (Schmerzen in beiden Unterbauchseiten als Quelle von Irrtümern in der gynäkologischen Diagnostik). *Deutsche med. Wchnschr.*, 1921, xlvii, 705.

In cases of pain in the lower part of the abdomen it is of importance to determine first whether it is persistent or colicky. Colicky pain is practically always associated with an affection of the appendix or cæcum. In the differential diagnosis from gynecological diseases pain on pressure on McBurney's point is of importance. Also helpful is hyperæsthesia of the skin in the ileocæcal region. In inflammatory processes a leucocytosis will aid in the differentiation from gynecological inflammations. Acute pyelitis may resemble appendicitis in its fever and general clinical picture but in such cases the pain on pressure extends from McBurney's point to the region of the kidney where there is hyperæsthesia. Affections of the ureters may give a similar picture.

In cases of marked pain in the right lower abdomen corresponding to appendicitis one must consider pyosalpinx and acute parametritis which may set up the same symptoms through irritation of the peritoneum. Difficulties may arise in such cases when, because of plastic empyema of the tube or ovary,

vaginal examination reveals nothing because of the rigidity of the muscles. It must be borne in mind also that in many virgins severe pain is caused by abnormal follicular bleeding. When an operation has been performed adhesion pains must be thought of. A peri-ureteritis with kinking of the ureter may also suggest appendicitis. Finally, one must consider membranous colitis as well as adhesions about the appendix which appear in the X-ray picture as distortions or displacements of the intestine.

In case of pain in the left side of the lower abdomen perisigmoiditis (pain during defæcation and obstipation) must first be thought of when the gynecological findings are negative. In these cases also, kinking of the ureter, pyelitis, venous thrombosis, psoas muscle involvement, and membranous colitis must be borne in mind. Spastic obstipation may cause pain in the lower abdominal region on the left side.

VORSCHUETZ (Z).

Giles, A. E.: The Causes, Prognosis, and Treatment of Sterility. *J. Obst. & Gynec. Brit. Emp.*, 1921, xxviii, 241.

The proportion of infertile marriages has been placed by various authors at from 2 to 20 per cent. Among 3,128 married women seen as patients, those who were sterile equaled 22.2 per cent. Many were under 40 and might yet conceive, and a large proportion sought advice because of some disease of the productive organs. The conclusion is drawn that the proportion of sterile marriages is well under 15 per cent. Simpson found it to be 10.9 per cent in village communities, and 16.3 per cent in families of the aristocracy.

The responsibility of the male is variously placed at from 10 to 90 per cent. In all doubtful cases, therefore, the wife should not be assumed to be responsible or subjected to operative procedures unless there is definite evidence that the husband is normal.

On the part of the male the ability to deposit healthy seminal fluid in contact with the os externum cervicis is necessary for successful impregnation. On the part of the female the ability to receive the seminal fluid is essential. The latter will be prevented by the absence of a vagina or uterus or of a communication between the vagina and uterus. A healthy condition of the uterus, tubes, and ovaries enabling the spermatozoa to travel up to meet the ovum is not found in cases of absence or marked underdevelopment of the uterus, congenital atresia of the tubes, or occlusion of the tubal channel by inflammation. Old age, the action of the X-rays leading to ovarian atrophy, anæmia, chronic morphinism, certain febrile conditions, and some nerve conditions, including pituitary disease, obesity, and the influence of internal secretions, do not permit the production and discharge of healthy ova. A healthy condition of the uterus enabling it to harbor the fertilized ovum is essential to the bearing of a living child. Uterine tuberculosis, carcinoma and sarcoma of the body of the uterus, and uterine fibrosis preclude this possibility and must be regarded as incurable causes of sterility.

Functional sterility, the result of incomplete intercourse due to impotence on the part of the male or nervousness or shyness on the part of the female, painful first attempt, and fear of confinement, azospermia, deficient vitality of spermatozoa, and sexual incompatibility are to be considered as factors in the production of sterility for which at the present time not much is offered in the way of successful treatment.

More hopeful are those conditions causing or favoring sterility but allowing treatment. Conditions which prevent normal intercourse, such as atresia of the vaginal orifice, may be relieved by the early establishment of the patency of the vagina. Stenosis of the vagina and rigidity of the hymen offer a good prognosis under dilatation or operative measures. The relief of dyspareunia and vaginismus depends on locating the source of pain and overcoming the mechanical difficulty. Pain due to prolapsed ovary or inflammatory changes in the appendages may require abdominal procedures, and if associated with retroversion, fixation of the uterus. In cases of vaginismus dilatation of the vaginal orifice under anaesthesia and suggestion may offer relief. Tumors encroaching on the vagina, whether ovarian or uterine, may cause a mechanical obstacle to intercourse. The treatment is surgical and the prognosis depends on the possibility of leaving at least one ovary and not too greatly damaging the uterus.

Prolapse and procidentia, which usually follow childbearing, are the causes of secondary sterility. As the obstruction is mechanical they allow treatment and offer a good prognosis. Conditions permitting intercourse but interfering with the ascent of spermatozoa, include underdevelopment of the uterus which is rare and as a rule due to delay in development which offers a fair prognosis. Ante-flexion of the uterus and stenosis of the external os are usually amenable to dilatation and the use of the intra-uterine stem. Retroversion of the uterus responds fairly well under operative treatment or the use of pessaries. Atresia of the os externum can be overcome in only a few instances, but an attempt should be made to restore the patency of the canal. When polypi are present in the uterine canal the prognosis ranges from very good if the polypi are small, to moderate or even poor if they are large. Salpingitis, if of a mild type, frequently permits conception, but often is tubal in character. If the tubes are occluded conception is obviously impossible. In some cases an artificial ostium can be made, but the prognosis must always be guarded.

When the cause of sterility lies in the male a vasovasostomy has been carried out when the vasa deferentia were occluded and there was evidence of live spermatozoa in the testicle. In cases of impotence artificial insemination has been done when the semen was normal.

Emphasis is placed on three points: the importance of bearing in mind the possibility that the male may be responsible, the guarding of prognosis as to a successful issue from treatment, and the necessity of

being reasonably certain that the husband is healthy before undertaking any operative procedure on the wife.

N. K. FORSTER, M.D.

Hellendall, H.: A New Method for Temporary Sterilization (Eine neue Methode zur temporären Sterilisierung). *Zentralbl. f. Gynaek.*, 1921, xlv, 822.

The author points to the fact that in all medical literature there has not yet been brought forth a method of sterilization whereby pregnancy can be surely prevented, but can be again rendered possible when desired. In a case in which Hellendall was obliged to induce abortion because of tuberculosis, the following procedure was used:

Incision, ventrofixation according to Olshausen, withdrawal of the tubes through a slit in the fascia to above the point of ventrofixation, and fixation of the tubes at this point under the skin. KALB (Z).

Okinčie, L.: The Influence of Present Conditions on Prolapse of the Female Genitalia (Ueber den Einfluss der Zeitverhältnisse auf den Genitalprolaps der Frau). *Verhandl. d. 6 Konferenz d. Wiss. Med. Ges.*, Petrograd, 1921, v, 30.

In association with general splanchnoptosis which, under present conditions, has greatly increased in Russia, prolapse of the female genitalia has also become much more frequent. The author examined 14,000 patients in his clinic in the period from 1915 to 1920. He divides his material into two groups, that of the three years from 1915 to 1917 and that of the three years from 1918 to 1920. This division is not artificial as it corresponds to the sudden alteration in the conditions of nutrition and labor. As the conditions of the times must have an extremely different influence on the various classes in Russia, he has divided his material also into two groups in accordance with the social status of the patients. In the first group belong the women of the working class who have always been accustomed to manual labor. There were 5,100 patients in this group. In the second group belong the women of the well-to-do classes and those engaged in intellectual pursuits. In this group there were 8,900 patients. The results of this study are summarized as follows:

1. The total number of patients of all classes who were suffering from vaginal and uterine prolapse for the entire period equalled 4.5 per cent. In the second three-year period the number of cases of prolapse in relation to those of the first three years had increased one and one-half times. The number of patients in each social class was the same in the first three years but in the second three-year period the number in the second class was twice that of the first class.

2. In the second three years the operations for prolapse increased in both social groups from 21 per cent in the first three years to 45 per cent in the second three years. The number of operations performed was 4 per cent higher among the women of the second group than among the women of the first group. A point especially worthy of note was that, though

the total number of operations performed on women of the second group was greater, the rise in the number of operations occurred earlier in first group.

3. In the second three years the protracted cases of internal genital prolapse increased. The number of cases of marked uterine prolapse increased from 2.5 to 10.5 per cent.

4. In the second three-year period complete prolapse of the uterus occurred in women under 30 years of age, while in the first three years no such cases came under observation.

5. Very marked was the increase of genital prolapse in women beyond the age of 50 (10 per cent). Particularly were the old women of the better classes thus afflicted.

6. Before the war 85 per cent of all women with genital prolapse were those who had lacerations of the perineum following labor. Next most frequently the condition occurred in women who had borne children but had no perineal tear (13.5 per cent). The cases of nulliparæ amounted to only 1.5 per cent. In the last three years the latter figure rose to 3.5 per cent.

Among women who had borne children and did not suffer a perineal tear the number of cases increased one and one-half times (21.5 per cent).

These figures show the profound influence of present conditions on women in general, and on cultivated women in particular, in Russia. These influences are to be sought in deficient nourishment and in great overstrain of heavy physical work. Genital prolapse is increasing particularly among the cultivated classes which, since 1918, have performed heavy work to which they are unaccustomed. On account of the insufficiency of transportation, conditions of heating and water supply, the impossibility of obtaining servants, and the various forms of obligatory communal work, the population is forced to heavy physical labor. The proportional increase in the cost of living (averaging 20,000 times) and the entirely insufficient return in natural products have led to general undernourishment of the inhabitants of Petrograd. One sees this phenomenon in the women of both social groups, but the undernourishment affects first the working people and the poor.

HESSE (Z).

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Schweitzer, B.: Experiences with Auto-Transfusion of Blood in Extra-Uterine Pregnancy (Erfahrungen mit der Eigenbluttransfusion bei Extra-uterin gravidit et). *Muenchen. med. Wchnschr.*, 1921, lxxviii, 701.

The value of auto-transfusion of blood has not yet been determined. In the Women's Clinic of the University of Leipzig in a period of one and a quarter years auto-transfusion of blood obtained from the abdominal cavity was done in twenty-one of thirty-four cases of extra-uterine pregnancy. There were two deaths. One patient died with the symptoms of h emorrhage despite the postoperative transfusion, perhaps because the transfusion was done first after the operation instead of during the operation. The second death must be attributed to the transfusion as it was followed by h emoglobinuria and death eight days later. The cause of the h emolysis of the blood lost in the first seven hours could not be determined. It appears, however, that auto-transfusion of blood is not without danger and that it should be resorted to only upon definite indications.

Freedom from infecting bacteria, absence of coagulation (defibrination is unnecessary), and preservation of the blood cells should be assured in all cases.

STRAUSS (Z).

LABOR AND ITS COMPLICATIONS

Koenig-Harburg, E.: A Calcified Myoma Fixed in the Pouch of Douglas as an Obstruction to Labor; Transperitoneal Cervical C esarean Section; Vaginal Myomectomy; Recovery (Verkalktes Myom, im Douglas fixiert, als Geburts-hindernis; Sectio caesarea transperitonealis cervicalis; Myomectomia vaginalis; Heilung). *Berl. klin. Wchnschr.*, 1921, lviii, 451.

Koenig describes a case in which a hard, chalky fibroleiomyoma was firmly fixed in the hollow of the sacrum, encroached upon the pouch of Douglas, and obstructed labor. The patient, a 22-year-old woman, was delivered by means of a transperitoneal c esarean section and manual loosening of the placenta. Four weeks later the tumor was removed through the posterior vault of the vagina. Good recovery followed.

ADLER (Z).

PUERPERIUM AND ITS COMPLICATIONS

Canney, J. R. C.: Sloughing of the Lower Uterine Segment Following Placenta Pr evia; Laparotomy; Recovery. *Brit. M. J.*, 1921, ii, 286.

The author reports a case in which sloughing of the lower uterine segment followed placenta pr evia;

operation was done on the twenty-second day postpartum and was followed by recovery.

The patient, a woman 27 years of age, had been delivered January 1 of her second living child. Twenty-four hours previously she had had a sudden severe h emorrhage and had called in her physician who made a tentative diagnosis of placenta pr evia. She failed to carry out his orders to remain in bed, but worked during the twenty-four hours which preceded delivery and suffered from no further h emorrhage.

Delivery was uncomplicated and occurred rapidly before the arrival of the obstetrician. The placenta, however, was retained and was removed digitally without an esthesia one hour later. It was found to be very adherent to the uterine wall. The first eight days postpartum were uneventful, but at the end of this time an irregular pyrexia developed, and on the fifteenth day a severe h emorrhage occurred.

The patient was sent to the hospital where examination revealed a pulse of 120 and respirations of 24 per minute. She was very an emic and weak. The abdominal type of facies was noted although the abdomen was soft. Vaginal examination revealed a uterus not particularly enlarged or tender.

Operative exploration led to the discovery of a soft mass in the posterior uterine wall which, on inspection, was found to be a loop of intestine. Laparotomy revealed dense adhesions of the pelvic structures with firm plastic peritonitis. An abscess in the cul-de-sac of Douglas was drained and the coil of intestine drawn up. The submucous coat of the bowel had been exposed by erosion, and resection was impossible. The appendix was removed and the wound closed around a large tube to the cul-de-sac. A tube from below was placed in the abscess cavity and removed twelve hours later.

The placental site had become infected and the bowel had been allowed to come through into the vagina by sloughing of the lower intestinal segment. The bowel loop then became adherent and its erosion led to pelvic peritonitis with abscess formation. The bacterium was not isolated, but Canney believes the infection was due to bacillus coli communis.

During the postoperative period the patient was febrile. In forty-eight hours her temperature rose to 101 degrees where it remained nocturnally until the fifth day when it rose to 103 degrees. Douches of Dakin's solution were used night and morning and the abdominal wound continued to drain freely. At the end of the second week the temperature was normal.

The patient was dismissed on the fifth week and two and one-half months after the operation was reported well.

W. N. ROWLEY, M.D.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Wolff, A.: Closed Tuberculosis of the Kidney (Die geschlossene, kavernoese Nierentuberkulose). *Ztschr. f. urol. Chir.*, 1921, vi, 314.

Wolff describes closed tuberculosis of the kidney in detail on the basis of nine cases diagnosed and operated upon by Bunge. Its development is favored by an obliterating or occluding process in the kidney pelvis or the ureter, a fact which led French authors to coin the expression "spontaneous nephrectomy." As a rule this condition is very rare, making up not more than 10 per cent of the cases of renal tuberculosis. Thus far, only eighty-eight cases have been reported in the literature, and of these, only twenty-one (including Bunge's case) were correctly diagnosed.

Pathologically the condition is a caseous closed tuberculosis of the kidney which, in rare cases, by the addition of a mixed infection, may lead to a closed tuberculous pyonephrosis. The obstruction is caused either by an obliterating tuberculous ureteritis or by plugging due to cheesy debris or blood clots. The obstruction is not necessarily permanent; in some cases it may be intermittent. Three cases of the latter type which were operated on by Bunge are also reported.

As a rule the obstruction forms in a descending manner, but in rare cases may ascend, as from the bladder or seminal vesicles. If the obstruction occurs early, a general dilatation results above it, but if it occurs late and is gradual, it leads to shrinking or complete destruction of the kidney. Fowler distinguishes two groups of such cases, one with tumor and the other with atrophy of the organ. In early and long-standing cases of obstruction of the ureter, bladder disturbances may have become cured and therefore the diagnosis may be rendered difficult by normal findings in the bladder. In the more usual case, in which there has been long communication with the bladder, there is contraction of the kidney with cavity formations and a fibrous or fibro-fatty degeneration. This is Zuckerkandl's "sclerosing" form in which there is often a marked increase in the hilus fat. The cavity formation is due to the expulsion of degenerated masses of caseous foci which, as a rule, are found at the juncture of the body and the cortex of the kidney and leads to the formation of true cavities with walls composed either of tuberculous granulation tissue or of tubercles. These cavities usually contain a milky urinous fluid.

The affection may remain restricted to one pole or involve the entire kidney. If the cavernous spaces reach to the surface, they may bulge out. In rare cases the picture may be entirely different, the kidney being changed into a whitish, homogeneous mass

divided here and there by thin connective-tissue septa—the massive degeneration called "putty kidney." Through the deposit of lime salts, calcification may take place. When there is simultaneous involvement of the kidney capsule there is usually a perinephritic sclerosis which can be detected by palpation and X-ray examination. In addition there may be perinephritic abscesses forming gravitation abscesses.

Clinically, the varied forms may be grouped into two main groups according to whether the affection has remained limited to the organ itself or, as in four-fifths of the cases, there is associated involvement of the bladder. In the latter the diagnosis is not difficult. In rapid obstruction of the ureter renal colic may develop as the result of the rapid rise in the intrarenal pressure. Kidney stones may then be suggested. In mixed infections the symptoms are stormier and fever is present. In slowly forming obstruction kidney symptoms may be entirely absent. A large kidney tumor is rare. When the involved kidney is small and sclerotic, the normal kidney may become compensatorily enlarged.

The ureter seldom causes well-marked clinical symptoms. When the ureter is permanently obstructed the urine may be normal, but usually there are signs of toxic damage in the other kidney: albumin, casts, leucocytes, and erythrocytes. In the diagnosis it is essential to determine the failure of urine secretion from the affected kidney. Therefore repeated examinations must be made. Above all, ureteral contraction must be absent. To demonstrate an obstruction Wolff especially recommends the ferrocyanide method which he believes is more certain than the indigo-carmin or phenolsulphonephthalein tests. If neither cystoscopy nor catheterization of the ureters is possible, a diagnosis is impossible and the only diagnostic aids remaining are the use of the X-ray and an exploratory operation on the kidney. The presence of tuberculosis in other organs may be of significance in the diagnosis.

In regard to the prognosis the author states that spontaneous recovery might be possible but no such cases have been proven. All things considered, however, the prognosis is unfavorable. The only expedient treatment is nephrectomy performed before the other kidney has a pronounced nephritis. Mild toxic damage or tuberculosis that is not too far advanced are not contra-indications as long as renal function has not been impaired too greatly. The expulsion of bacilli by the other kidney does not necessarily mean that it is affected by progressive tuberculosis.

Of the patients whose cases are reported, one died shortly after the operation from miliary tuberculosis, one died six months later from pulmonary tuberculo-

sis, and a third died six years later from uræmia. The others have recovered or their condition is decidedly improved.

DRAUDT (Z).

Berti, G.: *Experimental Research and Clinical Considerations Regarding Partial Resections and Compensatory Hypertrophy of the Kidney* (Ricerche sperimentali e considerazioni cliniche sulla resezione parziale e sull'ipertrofia compensatoria del rene). *Policlin.*, Roma, 1921, xxviii, sez. chir., 289.

Berti studied the morphologic and microscopic results following partial resection of a kidney in a number of experiments on animals. He describes one clinical case and states that he has collected 112 cases from the literature. The latter were as follows: fifteen cases of echinococcus cyst, with thirteen recoveries and two deaths; four cases of polycystic degeneration with three recoveries and one secondary nephrectomy; ten cases of solitary cyst with ten recoveries; eight cases of benign tumors with six recoveries, one secondary nephrectomy, and one death; five cases of malignant tumor with two recoveries, two secondary nephrectomies, and one death; fifteen cases of tuberculosis with seven recoveries, three recoveries with fistula, two secondary nephrectomies, two doubtful results, and one death; fifteen cases of simple pyonephrosis with fourteen recoveries and one death; eighteen cases of horseshoe kidney with twelve recoveries, two unknown results, and four deaths; twenty-three cases of various other lesions with nineteen recoveries, two recoveries with fistula, one secondary nephrectomy, and one death. In the entire 113 cases there were eighty-seven recoveries, eleven deaths, seven secondary nephrectomies, five recoveries with fistula, two unknown results, and two doubtful results.

In the residual portion of the kidney in the experimental animals the author observed compensatory phenomena manifested by dilatation and elongation of the tubuli scattered in the cicatricial connective tissue which showed, unlike others nearby, a several-layered epithelium with nuclei in karyokinesis. At the end of about one year the regressive changes observed in the vicinity of the cicatrix had completely disappeared, the kidney tending to resume its proper form and to separate from the lumbar wall to which it was fixed.

Neo-formation of either tubuli or glomeruli was never observed. None of the renal substance spared in the operation was capable of functioning. A part of it in the vicinity of the cicatrix became degenerated and sclerotic on account of connective tissue invasion, closure of the canals of the tubuli, or atrophy due to vascular alterations.

An increase in the size of the remaining normal kidney was constantly observed and was directly proportional to the length of time that had elapsed since the operation on the opposite kidney and the quantity of the organ that was removed. This compensatory hypertrophy in the remaining kidney was due to elongation of the secretory part of

the tubuli following an increase in cellular metabolism.

In their clinical application kidney resections should be confined to cases of benign and circumscribed inflammatory neoplasms and should involve only one pole of the kidney, possibly the cortex alone. Partial resection of the kidney is indicated in cases of malignant tumors in any stage of their development. As a diagnostic procedure the removal of small pieces of the kidney is allowable in certain suitable cases.

W. A. BRENNAN.

Sohn, A.: *Spontaneous Bleeding in the Kidney-Bed; Perirenal Hæmatoma* (Die spontanen Massenblutungen ins Nierenlager; circumrenales Hæmatom). *Deutsche Ztschr. f. Chir.*, 1921, clxiv, 48.

The author reviews the histories of the cases reported in the literature since 1910 and reports two cases of his own. As causes of spontaneous renal hæmorrhage may be mentioned erosion of the renal vessels by tumors or tuberculosis, the rupturing of aneurisms, and hæmophilia. Sohn distinguishes cases of primary renal hæmorrhage in which the hæmatoma is originally subcapsular, that is, within the fibrous capsule, and cases in which the bleeding has led to an extracapsular perirenal hæmatoma. Numerous cases are described in literature as primary perirenal hæmatomata. To these the case observed by Sohn is to be added and is noteworthy because of the fact that the fibrous capsule of the kidney was completely ruptured. An operation was performed on the basis of a diagnosis of ileus. On the left side was found an extensive retroperitoneal hæmatoma which was drained from an opening in the kidney. The 64-year-old woman died from an embolus in the artery of the fossa of Sylvius on the thirty-seventh day of her affection. Arteriosclerosis and sclerotic contraction of the kidneys were regarded as the causes of the renal bleeding.

Cases of intra- and extra-capsular bleeding are described in the literature. While most of the former can be traced back to one of the causes mentioned, the explanation of extracapsular hæmatomata is difficult. In many cases a hæmorrhagic perinephritis is given as a cause. This explanation, however, does not account for the frequent extensive and sudden hæmorrhages. The fact that torn blood vessels are never found speaks against rupture as a cause.

The symptoms of the affection are sudden violent pain in the kidney region, the signs of internal hæmorrhage, and the development of a retroperitoneal tumor. Disturbances of the intestinal tract are added thereto. The vomiting is to be regarded in many cases as reflexive. If intestinal paralysis develops, fæcal vomiting may occur. Blood in the stools, icterus, and fever belong to the rarer symptoms. Up to the present time the diagnosis has been made before operation in only three cases.

In a footnote the author mentions a second case in which a hæmatoma which had been present for several weeks was found during an operation per-

formed for another condition. This was an intracapsular hæmatoma. The author is in doubt as to its etiology.

SCHÉELE (Z).

BLADDER, URETHRA, AND PENIS

Thomas, G. J., and Mellen, D. H.: *Bilateral Cystocele or Cystic Dilatation of the Lower End of the Ureters—a Successful Method of Treatment.* *Minnesota Med.*, 1921, iv, 475.

The authors give a short review of the literature on cystic dilatation of the ureter and a sketch of the embryology. Cystocele is considered to be congenital in origin, and the concomitant occurrence of stone in the lower ureter to be a secondary result, not the cause of the condition. Cystocele is symptomless until infection supervenes, when an aching pain referred to the bladder develops in the loin. In many instances the pain is colicky, and at times there is vomiting.

Two types of cytocele have been recognized by means of the cystoscope. In the mild type the outlet of the ureters is a prominence or a cone-shaped tumor on the floor of the bladder. The opening of the ureter may be at the apex of the cone or on its side, or it may point posteriorly. In the more severe type of this condition the course of the ureter through the bladder wall appears as a distinct ridge. The portion of the ureter that protrudes into the bladder is usually club-shaped and broader than the portion which passes through the bladder wall. The ureters may open in any direction.

The treatment of choice is ureteral dilatation with lavage of the renal pelvis in the mild types and cold wire fulguration, opening the sac wide, in the severe types. In the experience of many operators surgical excision has frequently resulted in recontraction of the ureters. One case is reported in detail in which recontraction did not follow fulguration, as was demonstrated by subsequent examination one month later.

FRANK S. SCHOONOVER, M.D.

Dobson, J. F.: *The Diagnosis and Treatment of Cystitis.* *Brit. M. J.*, 1921, ii, 305.

The author refers to the large number of patients suffering for years from so-called chronic cystitis and treated with various remedies including drugs, official and unofficial, vaccines, bladder irrigation, catheterization, sounding, dilatation, and surgery, often without relief.

Inaccurate diagnosis is at the root of this unsatisfactory position in such cases. A patient with so-called cystitis cannot be cured by a few doses of drugs or lavage. This chronic complaint must be regarded as worthy of the closest investigation and study.

In comparatively few cases is the condition limited to, or primary in, the bladder. It would be better to drop the term "cystitis" and speak of "infectious conditions of the urinary tract."

The diagnosis requires three examinations which, in the majority of cases, will determine whether or

not diseases of adjacent viscera are causing or apt to cause the urinary infection:

1. Examination of the urine, including a passed specimen and a catheterized specimen taken by the practitioner himself with all aseptic precautions. In the female, after sterilization of the parts, it is advisable to pack sterile gauze around the urethral orifice before inserting the catheter. For accuracy, the bacteriologic examination should be done as soon as possible.

2. Rectal examination of the male to exclude diseases of the prostate, seminal vesicles, fissure, fistula, and hæmorrhoids, and both rectal and vaginal examinations of the female to exclude uterine enlargements and displacements, adnexal disease, and cystocele.

3. Abdominal examination for bladder distention or tenderness and pathologic processes in the appendix or kidney.

As further aids in the diagnosis an X-ray examination of the whole genito-urinary tract should be made and followed by a cystoscopic examination and pyelography.

There are many cases in which the urinary infection is so obviously secondary to some definite lesion of the urinary tract or adjacent organ that the active treatment of the infective process is of secondary importance to the treatment of the principal disease.

In the majority of cases of very acute infection of the urinary tract treatment must be limited to the administration of abundant fluids by mouth, alkalies, sedatives, and urinary antiseptics. Occasionally the intensity of the infection will require drainage, in which case the author advises suprapubic drainage with bladder installations of eusol through Carrel tubes.

The value of urinary antiseptics is very doubtful. We do not as yet possess any drug which, by oral administration, will be excreted in the urinary tract and control infection there existing with any certainty. The most universally accepted drug for this purpose is urotropin.

Bladder lavage is of value chiefly as a preliminary to the surgical treatment of enlarged prostate, stricture, tumor, calculus, etc. It is useless until the cause of the infection is ascertained. For lavage the author recommends silver nitrate. A 1:20,000 solution should be used at first and its strength then gradually increased.

Vaccines, in the author's opinion, are entirely useless in the treatment of cystitis.

Pyelitis will be found associated with cystitis in the majority of cases when no definite primary or accessory organic disease is discovered. This usually responds to general measures, the administration of fluids and alkalies, and rest. In recent years renal lavage with 5 to 20 per cent collargol has been used for chronic pyelitis. It has been demonstrated that collargol permeates the whole kidney, even the perirenal fat. The value of this treatment has yet to be proven.

L. H. FOWLER, M.D.

MacDonald, S.: Bladder Growths and Their Treatment. *Brit. M. J.*, 1921, ii, 310.

Neoplasms of the bladder fall into three main groups: (1) benign growths (papilloma), (2) malignant growths (carcinoma), and (3) growths of doubtful nature.

MacDonald considers diathermy the treatment of choice in dealing with an accessible papilloma. Subsequent observation is necessary and recurrences should be dealt with in like manner. Surgical removal may be followed by recurrences at the site of the scar. Operation is indicated in cases of multiple papillomata only when hæmorrhage, retention, malignancy, or infection makes it imperative. Excision of the pedunculated growths by transfixion and destruction of the sessile growths by diathermy should then be done. A patient over 45 or 50 years of age with a single papilloma should be subjected to open operation. This point is emphasized by two cases cited.

Delay in resorting to cystoscopic examination is responsible for the fact that about 50 per cent of the cases of carcinoma are inoperable when first seen. Bald or ulcerated growths are carcinomatous. Puckering, induration, associated nodules, or involved glands help to establish the diagnosis. The presence of short villi indicates malignancy.

In removing growths from the upper zone of the bladder MacDonald prefers to open the peritoneum first and, after closing it, to open the bladder. In this way injury to any adherent viscus is avoided. In removing a tumor from the base, the ureteral orifice is resected if necessary to make a wide excision of the growth. Preliminary catheterization of the ureter facilitates the operation.

Notes on eleven operations for carcinoma show that six required transplantation of the ureters. One patient died later of pulmonary embolism; two have since died of carcinoma; two have had further operation for recurrences; and six are in good health from one to five years after operation.

Growths of doubtful nature are those having short villi and a fleshy broad base. Of thirteen of this type removed by operation, eight proved malignant, while one of the remaining five, which at operation was deemed benign, has since proved clinically malignant.

J. W. ROSS, M.D.

Madier, J.: The Treatment of Balanic and Anterior Penile Hypospadias by the Method of Beck-von Hacker (Traitement de l'hypospadias balanique et pénien antérieur par le procédé de Beck-von Hacker). *J. de chir.*, 1921, xviii, 234.

Beck's ingenious operation for the correction of balanic hypospadias in which the urethral opening is situated a short distance from the base of the glans is described by the author in detail.

It will be recalled that this procedure consists essentially in a forward dislocation of the urethra. The utilization of the existing urethra by dissecting it free and displacing it forward makes it unnecessary to create a new canal.

In fifteen cases operated upon by Madier perfect results were obtained in thirteen. Fistulæ resulted in the remaining two cases. The illustrations accompanying the article are more complete than those found in the usual description of this operation.

LOYAL E. DAVIS, M.D.

GENITAL ORGANS

Pannett, C. A.: The Treatment of the Imperfectly Descended Testicle. *Lancet*, 1921, cci, 379.

Present methods of treating imperfectly descended testicle are conceded to be unsatisfactory. The condition seems to be due to the lack of some chemical stimulus and the future of treatment lies in the discovery of this defect; until this is accomplished, improvement in technique should be attempted.

Two classes of deranged descent are recognized. In the first, the testicle is arrested before it emerges from the inguinal canal, and in the second it emerges from the external abdominal ring, but is diverted to an abnormal situation instead of passing into the scrotum (the ectopic testicle).

In cases of the first group average activity cannot be expected however long the testicle is treated. Orchidopexy usually results in atrophy and is a difficult procedure because of the shortness of the spermatic vessels. The Bevan operation leads to total atrophy and loss of spermatogenesis and internal secretion. Clinically and experimentally orchidocelioplasty seems a preferable method as following its use the development of the male characteristics is preserved. Spermatogenesis, however, is destroyed. Apparently this destruction is due to inability of the seminal tubules to secrete against high resistance unless aided by contractions of the cremaster muscles rather than to interference with the circulation.

The ectopic testicle can usually be replaced in the scrotum and this operation is followed by normal function.

Early operation is not recommended. It is preferable to wait until the patient is between 8 and 12 years of age in order to give the testicle every chance to descend of its own accord. Attacks of pain due to torsion or injury and the presence of a large hernia or strangulation are indications for immediate operation.

R. M. NICHOLS, M.D.

Hunt, V. C.: Complications of Prostatectomy. *Minnesota Med.*, 1921, iv, 478.

In the Mayo Clinic complications of prostatectomy occur almost exclusively in the treatment of benign hypertrophy, since carcinoma of the prostate is usually not treated surgically.

The type of gland or its degree of enlargement has no relation to the amount of disturbance it may produce, but the subsequent renal insufficiency and urea retention are directly related to the amount of residual urine and infection. Pre-operative recognition and treatment of actual or potential uræmia are responsible for the present infrequency of postoperative uræmia. Residual urine amounting to two or

more ounces should indicate preliminary catheter drainage of the bladder.

Operative and postoperative complications of prostatectomy have been minimized by the suprapubic open operation. This enables the surgeon to deal with diverticula, calculi, and hæmorrhage from the capsule or at the neck of the bladder. The posterior transverse bar at the bladder neck, which is sometimes left after enucleation, may interfere with complete emptying of the bladder and can be eliminated by a V excision of the bar back into the trigone. Cardiac and pulmonary complications occur less frequently following preliminary treatment and proper selection of the anæsthetic.

Postoperative pulmonary complications are uncommon, largely because of the shortness of the time the patient remains in bed. Death from pulmonary embolism is also rare. Postoperative uræmia develops only in patients in whom back pressure in the kidneys and severe infection have caused so much renal damage that it cannot be repaired by bladder drainage. Secondary hæmorrhage occurs occasionally and is profuse, but can usually be controlled by removing all catheters and avoiding vesical irrigation. Transfusion may be necessary in some instances. Hæmorrhage can be minimized best by avoiding postoperative irrigation and unnecessary manipulation of the drainage tubes. Infection of the paravesical space may be obviated largely by emptying the bladder with a urethral catheter immediately before operation, by instituting thorough drainage of

the space, and by making a moderately loose closure of the abdominal wall.

The incidence of epididymitis is more common in patients who have been subjected to urethral catheter drainage of the bladder, but may be lessened materially by rigid asepsis.

A persistent suprapubic sinus is usually due to incomplete removal of the prostate, a transverse bar at the vesical neck, stricture of the prostatic urethra, a large diverticulum, or non-absorbable suture material. If a blind operation is performed, remnants of the capsule may be left which later produce obstruction by ball-valve action at the urethral orifice.

General sepsis occurs occasionally when prostatectomy has been performed in the presence of marked local infection. The most common cause of this complication, however, is probably the indiscriminate postoperative use of the urethral catheter in attempting to close the suprapubic sinus. Empyema, suppurative arthritis, meningitis, etc. may develop.

In order to reduce the complications of prostatectomy the following facts should be borne in mind:

1. Preliminary preparation of patients with prostatic hypertrophy improves their general condition, increases renal function, reduces infection, and decreases the liability of postoperative uræmia.
2. Open suprapubic technique enables the surgeon to perform an accurate operation under the guidance of the eye, to control bleeding, and to deal with co-existing lesions of the bladder.

CLAYTON F. ANDREWS, M.D.

SURGERY OF THE EYE AND EAR

EYE

White, L. E.: Accessory Sinus Blindness: Differential Diagnosis and Operative Technique. *Boston M. & S. J.*, 1921, clxxxv, 133.

The author considers the subject under five heads: (1) the differential diagnosis, (2) recovery with or without operation, (3) operation with so-called negative nasal findings, (4) operative technique, and (5) fatalities.

In making the diagnosis White is very careful to consider all causes of blindness simulating closely or exactly that from accessory sinus disease. He mentions more than a score of such frequent causes, local, intracranial, and general, and attempts by very thorough neurological and other examinations to exclude them before operating on the nose unless there is a very evident reason why an operation should be performed hastily.

White is inclined to a policy of watchful waiting if there seems to be evidence of continued recovery without operative treatment. He cites a number of cases in which complete recovery from an evident retrobulbar neuritis due to sinus disease occurred without operation, but mentions as many or more in which permanent damage resulted from hesitancy in operating. Early operation frequently saves sight which would otherwise be lost. For instance, of six patients operated upon within the first week of optic neuritis all recovered with normal vision; of five operated upon within two weeks, two recovered with normal vision, two with sight impaired, and one with vision of fingers at 6 in.; of four operated on between the second and fourth week, one only obtained normal vision; of four operated on between one and two months, one recovered with normal vision, one with slight impairment, the third could count fingers at 3 ft., and the fourth was totally blind; of five operated on after two months three had almost negligible improvement in sight and the other two had no improvement whatever. "Commencing pallor or undue engorgement (of the retinal vessels) indicates the advisability of unloading the congestion (in the sinuses)."

White does not find that an exploratory operation in the nose is any worse than an exploratory operation in the abdomen. In this connection he quotes a number of prominent men in this country who have strongly advocated exploratory operative procedures in cases of blindness when there are no apparent nasal findings.

The author discusses the radical sphenoid operation, the exenteration of all the posterior ethmoid cells and the sphenoid, and his own operation in which he opens the anterior sphenoidal wall, makes a small opening into the posterior ethmoid cells, and removes only enough

turbinate tissue to obtain access to these parts. He says, "The ventilation and depletion incident to the operation outlined will relieve the pressure and infection about the nerve." This will not imperil life, will not injure the function of the nose, and will not be followed by crusting or dryness. It is essentially necessary at all times to keep one's bearings during such an operative procedure and to do so requires patience and a field not filled with blood and débris. The subject of fatalities is dealt with on a purely theoretical basis as all of White's patients survived. Meningitis is the chief danger. White emphasizes the necessity of leaving sufficient reinforcement in the skull so that the dura is not exposed. Cadaver work is one of the essentials for an inexperienced operator.

Four cases illustrating the points made by the author are reported rather fully.

THOMAS D. ALLEN, M.D.

Solares, A.: Hydatid Cysts of the Orbit (Les kystes hydatiques de l'orbite). *Arch. d'ophth.*, 1921, xxxviii, 491.

Orbital cysts are more apt to be confused with sarcoma than with other orbital neoplasms but sarcoma is an intra-ocular tumor which appears only after a long period of blindness and glaucomatous symptoms. In Solares' opinion hydatid cysts never occur within the eye. In doubtful cases of intra-orbital cysts exploratory puncture will usually clear up the diagnosis.

In treating a hydatid cyst of the orbit evacuatory puncture is insufficient and incision followed by drainage is not advisable. The only rational and radical treatment is complete extirpation of the cystic pocket. If the tumor is more or less superficial it can be extirpated under local anæsthesia, but if it is deep, an orbitotomy may be necessary or even a Kroenlein operation. If fragments remain, they should be dislodged by curettage and the cavity then rinsed with formal solution to kill any embryo cells which may be present.

The author reports a case of orbital hydatid cyst in a child aged 6 years. The condition was thought to be sarcoma until an exploratory puncture showed the organisms. A Kroenlein orbital operation was done under chloroform anæsthesia. The cyst was exposed when the orbital wall was turned back. The cyst was drained and the sac extirpated. Two days after the operation a corneal ulcer developed which the author attributed to anaphylaxis. This soon healed. The child left the hospital six weeks later practically well and at the end of two years the condition of the eye was satisfactory.

The author reports also the cases of three adults between 17 and 25 years of age. W. A. BRENNAN.

Good, R. H.: A Simplified Operation for Obstruction of the Nasolachrymal Duct. *Am. J. Ophth.*, 1921, iv, 597.

This article, which includes two illustrations, shows the author's method of gaining access to the lachrymal duct from below after the introduction of Bowman probes. The steps of this procedure are as follows:

1. The portion of the inferior turbinate lying anterior to the opening of the nasolachrymal duct is removed.
2. A grooved Bowman probe is introduced.
3. An incision is made through the mucous membrane from high up just in front of the middle turbinate down to the edge where the inferior turbinate has been removed and to a point just anterior to the probe. The membrane is then elevated forward and backward. In this way two triangular flaps are formed with their apices above.
4. The bony wall is chiseled away to about the middle of the sac.
5. A small crow-beaked knife is placed in the groove of the lachrymal probe at the inferior end and carried along the groove upward, the entire duct and half the sac being thus incised.
6. The flaps are replaced and the operation is completed.

Good cites five cases. He states that his operation differs from others in that it does not form an artificial duct but merely enlarges the natural opening in such a way that it will not be closed by the contraction of scar tissue. THOMAS D. ALLEN, M.D.

Albright, G. C.: Subconjunctival Dislocation of the Crystalline Lens. *Am. J. Ophth.*, 1921, iv, 601.

This is such an exceedingly interesting case report that justice cannot be done it without quoting it practically entire. Twenty years previously the patient had had a downward iridectomy for glaucoma. A year later a cataract developed without any increase in the glaucoma. After twelve years of waiting the vision became so poor that the patient could only tell light from dark. At this time she accidentally struck the eye against the brass knob of a bed post. The pain was slight but she was taken to a hospital where she remained for several weeks without operative interference. When discharged, her vision was very much better and she was told that the cataract had been dislocated backward.

For four years the eye remained quiet and the vision about stationary. A small yellow lump was then noted beneath the conjunctiva near the limbus. Later this lump disappeared. In examining the eye at this time the author lifted out the lens from the fornix on the tip of a cotton probe. This lens was submitted to a pathologist for examination who reported that it was a cataractous lens.

In referring to this case Albright says, "It cannot be definitely said to be traumatic, but is more probably traumatic than spontaneous. The patient's general tonicity was the lowest that I have ever seen, and her reaction to trauma or irritation about the slightest.

This might account for the ease with which the lens was extruded through the sclera and would certainly have a bearing in explaining why the lens mass would remain in the fornix as a foreign body for the week or ten days after its expulsion through the conjunctiva." THOMAS D. ALLEN, M.D.

Wheeler, J. M.: Restoration of the Obliterated Eye Socket. *Ohio State M. J.*, 1921, xvii, 456.

The author describes a method he has developed to restore the eye socket so that an artificial eye may be worn when the conjunctival cul-de-sac has been destroyed by trauma or burns.

If the lid margins are adherent, they are separated by an incision. The dissection is then carried out in such a way as to separate the lids from the orbital contents. The following important points should be borne in mind:

1. The dissection must be kept superficial so that in front of the dissecting knife or scissors there is only lid tissue, i.e., only skin, orbicularis, the thin fascia of the lid, and the tarsus. It is not necessary to save the tarso-orbital fascia with the lid. Carrying the dissection back into the orbital tissue is probably one of the most common causes of failure.

2. Not only the superficial plane of the dissection, but the extent and limitations of the dissection are of importance. Temporally and below, the dissection should be carried well to the orbital margin or even 1 or 2 mm. beyond it as the graft must adhere to the periosteum of the anterior aspect of the orbital margin. On the nasal side the dissection should be extended to the anterior crest of the lachrymal groove and to the orbital margin above it. In dissecting the inner canthus the caruncle should be saved if it has not been destroyed. The graft will adhere to the posterior surface of the caruncle and give it a permanent lining. In the division of the tissues above, the dissection should be carried behind the orbital rim but not necessarily to the roof of the orbit.

3. In preparing the bed for the graft all cicatricial and granulation tissue should be removed. Excision of granulation tissue is especially important as the contraction of such tissue may result in contraction of the socket. Reduction in size of the newly made socket is due to contraction of the underlying tissue rather than to contraction of the skin itself.

4. A common fault which manifests itself after restoration of the socket is too much thickness of the lid margin. This deformity can be obviated by cutting away the tarsus. If the skin graft must extend completely to the margin of the eyelid, the tarsus may be split and thinned. If the graft is to extend nearly to the margin, sufficient tarsal plate may be cut away so that the graft will set in as an inlay. In any case, enough tarsus should be left to support the cilia, but not necessarily any more. A form should then be molded to fit the cavity. Dental impression compound is ideal for this purpose. Ordinarily for full restoration of the socket,

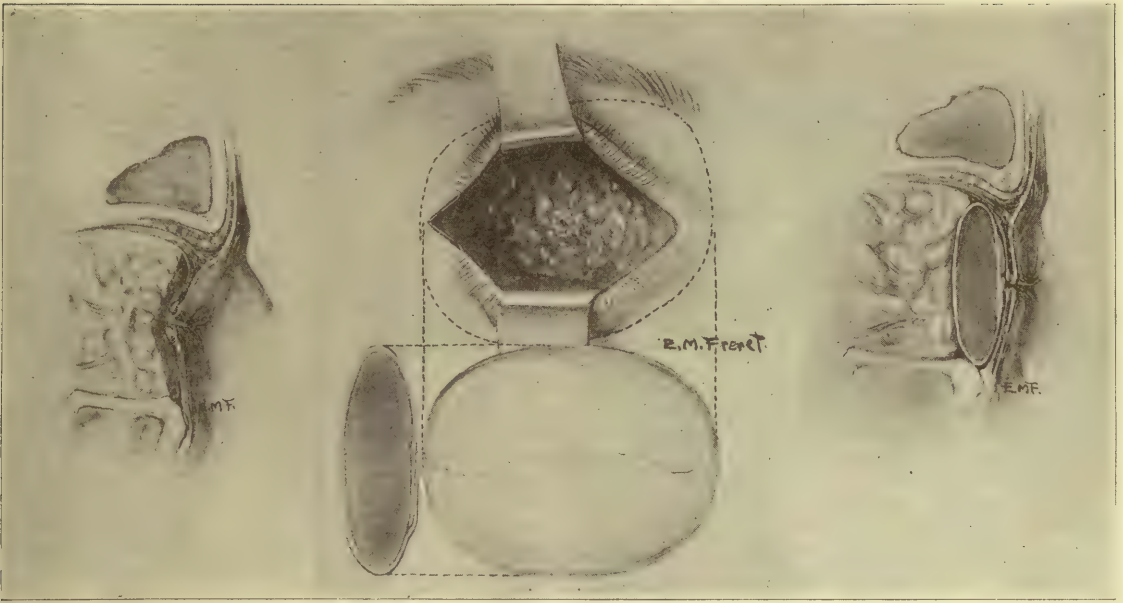


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 1. Cross section through orbit and eyelids to show dissected cavity between eyelids and orbital contents for new socket.

Fig. 2. Dissection completed. Eyelids retracted to show bed for reception of graft. Orbital margin indicated

by curved dotted line. Below: Cross section and front view of form completely covered by epidermic graft, ready for introduction to the prepared cavity.

Fig. 3. Cross section showing form covered with epidermic graft placed for lining of new socket.

the dimensions are approximately as follows: length 40 to 45 mm., width 30 mm., thickness 4 or 5 mm.

The ideal graft for socket restoration is one without perforations which is made up of epidermis only, is free from layers of true skin, and is large enough to be wrapped around the form of impression compound with generous overlapping. This means a graft 3 to 3½ in. long and 2½ to 3 in. wide. The outer aspect of the thigh is the best source from which to obtain a large epidermic graft.

The graft of epidermis is immediately wrapped about the form of impression compound, raw surface outward, and overlapped on the surface which is to be anterior. The form, completely covered with epidermis, is forced into the socket cavity. It is not necessary to remove small blood clots before placing it as they will not prevent a take. The overlapping portion of the graft is placed forward so that if the edges are disturbed by manipulation they can be carefully replaced through the palpebral fissure so that every part of the form will be covered.

No sutures are used. A pressure bandage is applied, and over this adhesive strips. Very firm pressure is of importance to secure accurate contact at all points and to keep the cavity absolutely obliterated. This first dressing is left in place for a week. The form is left in place and is not touched for three

weeks. It is then removed and left out permanently. The artificial eye may be introduced at any time.

If the surgeon has been successful in carrying out the technique he will have a permanent socket extending well beyond the canthi and of sufficient dimensions all around. The lids will be normally thin and pliable and the thin-walled socket will not prohibit motility of the stump and artificial eye, although the movements of the eye will be less than following ordinary enucleation.

EAR

Barany, R.: Modern Labyrinthology. *Laryngoscope*, 1921, xxxi, 401.

The author presents some very interesting observations in the study of labyrinthine conditions.

Arrest of nystagmus by closure of the eyes. Barany believes that in closure of the lids all the eye muscles are intensely innervated, and the more intense the lid closure, the more intense the innervation. The arrest of the vestibular nystagmus depends on the simultaneous innervation of agonistic and antagonistic innervation and the consequent blocking of these opposing muscles. This arrest is a purely peripheral mechanical check. Divergence in the normal may be explained by the fact that the position occurs as a result of the simultaneous action of the ligament apparatus of the eye, and not because the rectus

internus is a stronger muscle than the rectus externus.

Arrest of rotary vestibular nystagmus by convergence. Observations by Barany have proven that during very intense convergence an intense rotary nystagmus may be completely checked, but vertical nystagmus remains unaffected. The following explanation is offered: If the rotary nystagmus can be determined, it is produced by the turning inward of the eye due mainly to the action of the recti superior and inferior muscles, while a vertical nystagmus is due to the action of the obliquus. In maximal convergence, not only the rectus internus, but also the recti superior and inferior come into action, and these also have a slight convergence influence by their simultaneous innervation, thus checking the rotary nystagmus. The vertical nystagmus, however, uninfluenced by the recti superior and inferior, remains unchanged.

Observations on the position of the eyes during sleep. The statement offered by many textbooks that the eyes are rolled upward during sleep is considered erroneous by Barany. When the lids are closed but apparently relaxed during sleep the eyes are in a position almost directly forward, sometimes slightly downward or upward. A marked rolling upward is never present. If the lids are clumsily lifted, a reflex naturally results and is followed by an upward rolling of the eye. If the lids are carefully lifted so that the subject is not disturbed, the eyes will never be found in an intense upward position.

Deviation of the eyes when the eyelids are closed. Deviation of the eyes in a normal subject when the lids are closed has never been seen by the author, but this condition does occur in case of destruction of the labyrinth, hemiplegia, and epilepsy. In cases of destruction of the labyrinth it frequently occurs as early as the second or third day. It has often been found present after spontaneous nystagmus has disappeared. In hemiplegia it occurs simultaneously with the disappearance of the cortical or subcortical conjugate ocular paralysis to the side of the paralyzed muscles and proves that one-sided cortical or sub-

cortical ocular paralyses are never found in long-standing cases. In epilepsy it is probably a sign of a cerebral focus.

Rocking movement of the eye synchronous with the pulse; peripheral; labyrinth tonus. A rocking movement of the eye results from the fact that the first slow ocular movement occurs simultaneously with the pulse wave and the second opposing ocular movement occurs distinctly after the pulse wave has passed.

The following conditions are requisite for the occurrence of the slow, rocking ocular movement with that of the pulse: hyperæmia, ready stimulation of the nerve endings in the labyrinth, ready stimulation of the centrum in the medulla, the presence of fistula or an abnormally weak point in the labyrinth wall, increased sensibility in the centrum in the medulla, free circulation of the endolymph.

The slow ocular movement is explained on the basis of the to-and-fro movement of the endolymph which is brought about by the congestion or depletion of the vessels in the labyrinth. As the result of this observation the hypothesis of Shambaugh may be realized, namely, that the pulse wave in the normal subject influences the endolymph in a to-and-fro motion and thereby establishes the tonus of the vestibular apparatus from the periphery.

Vasomotor phenomenon in the vestibular apparatus in lues and labyrinth fistula. In attempting an explanation of this phenomenon the author states that the Hennebert fistula symptom is dependent upon an abnormal mobility of the stapes. This points to the fact that a number of cases of lues with this symptom demonstrate a negative Rinne and leads to the consideration of an affection in the region of the stapes.

The vasomotor phenomena in labyrinth fistula may be very diversified. All possible combinations may occur. Pressure in the ear may produce the same result as pressure over the mastoid. Pressure over the carotid may produce the converse result of pressure in the ear. Pressure over both carotids may have the same effect. J. C. BRASWELL, JR., M.D.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Beck, J. C.: Review of Twenty-Five Years' Observation in Plastic Surgery, with Special Reference to Rhinoplastic Surgery. *Laryngoscope*, 1921, xxxi, 487.

Beck calls attention to the necessity for thorough training for men who attempt plastic surgery. This training cannot be obtained unless the fundamental principles are secured by years of experience.

In the correction of minor nasal deformities the author used paraffin for a number of years with good results. He later abandoned this technique because of reports of serious complications following its use by others.

The technique advanced by Joseph has given excellent results. The author prefers bone or cartilage to celluloid, aluminum, gold, or silver, claiming that a foreign body is not well borne by the tissues about the nose.

J. C. BRASWELL, JR., M.D.

Whitham, J. D.: The Reduction of Old Fractures of the Nose. *Laryngoscope*, 1921, xxxi, 620.

The author describes a method of correcting deformities of the nose due to old fractures. A small skin incision having been made, the nasal process of the superior maxilla is cut through on each side with a chisel. The nose is then mobilized until the desired position is obtained and is then held in the proper position by means of an external splint of silver wire which is fastened to the teeth in the incisor region, bent upward, and pressed against the nose.

FREDERICK CHRISTOPHER, M.D.

THROAT

Thompson, S.: Cancer of the Larynx. *Laryngoscope*, 1921, xxxi, 522.

Rapid progress has been made in the treatment of cancer of the larynx during the past twenty-five years. Solis-Cohen and Butlin were pioneers in this field.

The author classifies cancers of the larynx into intrinsic and extrinsic cancers.

The failure of the laryngofissure operation has no doubt been due to the inadequate investigation of the diagnosis and natural progress of intrinsic cancer. By this method the author has successfully operated upon ten cases without a fatality and with only two recurrences. There has not been a single death attributable to the operation.

Complete laryngectomy is necessary in some cases but in Thompson's opinion many should be recognized earlier and operated upon by the laryngofissure method.

Lateral pharyngotomy may be developed for growths in the epilaryngeal region or on the pharyn-

geal surface of the cricoid cartilage so that the more mutilating operations will be unnecessary.

In conclusion the author states that extrinsic cancer of the larynx is a very serious disease and only a small proportion of the cases may be saved even by a mutilating operation.

Intrinsic cancer is more frequent, and with the education of the public and the profession regarding the importance of an early diagnosis, more cases will be subjected to laryngofissure. The operation is not very dangerous, leaves the patient a useful voice, and enables him to earn his living and take his place in society.

J. C. BRASWELL, JR., M.D.

Frank, I.: Retropharyngeal Abscess. *J. Am. M. Ass.*, 1921, lxxvii, 517.

Frank discusses the history, etiology, anatomy, pathology, symptoms, differential diagnosis, complications, and treatment of retropharyngeal abscess.

Etiologically the abscess is the end-stage of a lymphatic gland involvement due to a neighboring or remote infectious process in the nose, sinuses, ears, mouth, teeth, pharynx, or larynx. It is essentially an affection of early childhood.

Anatomically, the retropharyngeal glands lie in the loose areolar tissue behind the pharyngeal wall and in front of the deep, prevertebral muscles at the level of the upper two or three cervical vertebræ.

Pathologically, the evolution of an untreated abscess is as follows:

1. It may burst spontaneously and drain its contents into the pharynx.

2. Guided by the prevertebral fascia behind which it is situated, the pus may burrow its way laterally to the side of the neck behind the large vessels and the sternocleidomastoid muscle, and into the posterior lateral triangle of the neck. If it weakens and ruptures through the fascia, it may present itself anterior to the sternocleidomastoid muscle in the anterior triangle.

3. The pus may be guided downward by the prevertebral fascia to the lower part of the neck. The fascia passes behind the subclavian trunks and, forming the posterior wall of the sheath of the axillary vessels, may guide the pus under the clavicle and into the axilla. This rare type is usually the chronic cold abscess of a cervical Pott's disease.

4. The abscess may travel downward behind the esophagus into the posterior mediastinum.

The symptoms are often not sufficiently prominent to attract attention until the local process has increased to such an extent that it interferes to a greater or less degree with respiration, deglutition, or both. The variations in the symptoms in different cases are due chiefly to the location and the extent of the abscess. If the tumefaction is situated high in the

pharyngeal wall, respiration is not interfered with; there is, however, difficulty in deglutition and a nasal intonation is noticeable in the voice. If the swelling is lower in the throat, respiratory symptoms become more prominent.

In the differential diagnosis the following affections must be kept in mind: (1) aneurism of the common carotid artery burrowing into the retropharyngeal space, (2) cervical Pott's disease, (3) acute osteomyelitis of vertebræ, (4) non-suppurative lymphadenitis of retropharyngeal lymph nodes, (5) peritonsillar abscess, and (6) laryngeal affections.

Complications are: (1) the spreading of the infecting process by the blood and lymph streams, causing septicæmia, pyæmia, or distant infections, such as meningitis; (2) the spreading of the process by continuity, producing spontaneous and serious hæmorrhage by infectious erosion of the large vessels of the neck and through the spreading or burrowing of the abscess downward, involvement of the mediastinum or rupture into the œsophagus; (3) some mechanical process, such as pressure of the tumefaction

forward on the epiglottis and larynx, with cedema and air hunger sufficient to require emergency tracheotomy, or spontaneous or artificial rupture of the abscess with aspiration of the infected content, producing pneumonia, lung abscess, or asphyxia.

In the treatment the author wraps the child in a sheet or blanket, with the arms at the side of the body and the legs extended. He then lays it flat on the table, with the head turned toward him, and the moment the abscess is opened, turns it quickly on its stomach and elevates the body somewhat above the level of the head.

In opening the abscess the index finger of the left hand is inserted into the child's mouth to locate fluctuation or the most pronounced area of pointing. With the finger maintained in this position, an artery forceps without teeth, somewhat curved, and moderately pointed, is introduced closed into the mouth along the inserted finger and directed by the latter to the point of election. The hæmostat is pushed quickly into the body of the abscess and withdrawn with the blades widely opened. O. M. Rorr, M.D.

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